Symmes Maini & McKee Associates
PROJECT MANAGEMENT

SMMA

October 18, 2019

Mr. Brian Lynch
Project Coordinator
Massachusetts School Building Authority
40 Broad Street, Suite 500
Boston, Massachusetts 02109

**Re: Fuller Middle School** **Framingham, Massachusetts**

*90% Construction Documents Submission to the MSBA* *SMMA No. 17050*

Dear Brian:

Attached please find the Module 6 90% Construction Documents submission to the MSBA. The team has followed the guidelines set forth in Module 6 to develop this submission. We look forward to reviewing the information contained in this submission with you and your team.

SMMA certifies that (1) we have reviewed and coordinated the materials, (2) the submittal is complete, (3) the Proposed Project as documented within the submittal is within the District's Budget, and (4) the District has approved the materials for submission to the MSBA.

Please contact me at 617-520-9403 if you have any questions, comments, or would like to schedule a meeting.

Thank you.

Very truly yours,

**SMMA | Symmes Maini & McKee Associates**

Joel G. Seeley
Project Director

cc: Framingham School Building Committee; Philip Gray, Jonathan Levi Architects (MF)

enclosures: 90% Construction Documents Submission

JGS/sat /P:\2017\17050\03-DESIGN\3.4 Submissions\5-60% CD Submission\OPM Deliverables\Northbridge Sample\0_OPM Cover Transmittal Letter\L_Blynch@MSBA_60% Construction Documents_9August2019.Docx

1000 Massachusetts Avenue
Cambridge, MA 02138
617.547.5400

www.smma.com

FULLER

# Construction Documents - 90%

**Fuller Middle School, Framingham, Massachusetts**

Owner
City of Framingham, Massachusetts

Client
City of Framingham, Massachusetts

Architect
Jonathan Levi Architects LLC

Owner's Project Manager
SMMA

Construction Manager at Risk
Consigli Construction Company

October 18, 2019

## 6C.1 Summary Comments



## 6C.2 OPM Deliverables

## 2.1 Submittal Review and Coordination



## 6C.3 Designer Deliverables



## Appendices

## 6C.1 Summary Comments

## 1.1 Basic Project Information

*Introduction*

The Fuller Middle School project is anticipated to serve 630 students in grades 6-8. When the new school is complete, the students will move out of the adjacent existing middle school, which will then be demolished. The proposed building program based on Framingham's Educational Program and the Project Funding Agreement comprises 137,100 GSF. The project will be constructed under the Construction Management at Risk methodology in accordance with M.G.L. Chapter 149A. Consigli Construction Company has been formally selected as the CMR for the project.

Construction on the Phase 1 site enabling package began when the students finished their school year in June 2019 and was completed in time for the new school year starting August 28 on time and on budget. This work includes temporary parking, new permanent parking, utility work, geotechnical ground improvement, and geoenvironmental soil abatement.

### *Schedule Summary*
The project's scheduled milestones are as follows:

### *Design*
Site enabling 100%: 5/10/19
60% CD, 100% Early Concrete and Steel Package: 8/9/19
100% Masonry Package 10/18/19
90% CD: 10/18/19
100% CD: 11/22/19

GMP approval 1/3/20

### *Construction*
The project will have 3 construction phases
Phase 1 site enabling substantial completion 8/20/19
Phase 2 building substantial completion 6/15/2021
FF&E technology installation 6/15/2021 - 7/30/2021
Phase 3 Demo and site work substantial completion 12/20/2021

## 6C.2 OPM Deliverables

### 2.1 Submittal Review and Coordination

#### 2.1.1 Submission Review

The OPM has reviewed the Designer's 90% Construction Documents Submission and recommends the Owner approve the submission.

*OPM REVIEW*

The OPM performed a review of the Progress 90% Construction Documents, dated September 9, 2019. The OPM comments are documented in the OPM Design Review, dated September 23, 2019 and appended to the end of this section.

1. Technical Accuracy, Coordination and Clarity – The design documents at this 90% Construction Documents Phase contain the typically expected level of technical accuracy. Areas of the building are laid out in plan, elevation, and section, and are generally consistent with the space summary and design requirements of the MSBA and DESE. The sitework, concrete and steel documents are developed to a more complete level due to the Early Site Package and Early Concrete and Steel Package development. The 90% Construction Documents drawing set includes detail and schedule development appropriate to this level and reflects the complexities of the project design, systems and site constraints. The design documents at this 90% Construction Documents phase contain the expected level of coordination and clarity.

2. Efficiency and Cost Effectiveness – The project as designed represents a very efficient and compact floor plan that allows the existing building to remain operational for the duration of construction. The location of the mechanical room and electrical room maximizes the efficiency of the system, while also allowing for an efficient piping distribution. The building layout is a cost-effective solution. The materials and equipment included in the design represent generally accepted materials for school construction projects. The District's Buildings and Grounds Staff has participated in the material and equipment selections.

3. Operability – The project is designed for ease of operation. The location of support spaces are within appropriate distances to the spaces they serve. Access to equipment for preventative maintenance is thoughtful. Lastly, the easy segregation of the public spaces from the instructional spaces, facilitates community use in an efficient and easily maintained manner.

4. Constructability – Several meetings between the Construction Manager, the OPM and the Designer on constructability and logistics have occurred. The OPM review of the progress 90% Construction Documents set did not surface any significant constructability issues.

5. Phasing – The new school is located on the site to allow for the continued operation of the existing school. Once the new school is completed, it can operate unimpeded while the existing is demolished and the parking lot and fields are completed.

6. Bid-ability – The MEP elements of the progress 90% Construction Documents drawing set have been coordinated to the level of 90% Construction Documents set. The general layout of the building, floor to floor construction height and the relationship between spaces will facilitate further coordination. The OPM review did not surface any significant bid-ability issues.

7. Site Access During Construction – As noted in the Phasing section above, the project has been designed to allow for site access to the operational school during both Phase I and Phase II construction.

### *CM REVIEW*

The CM performed a review of the Progress 90% Construction Documents, dated September 9, 2019. The CM comments are documented in the CM Design Review, dated October 7, 2019 and appended to the end of this section.

SMMA

PROJECT MANAGEMENT

# OPM Design Review Comments

| | | | |
|---|---|---|---|
| **Project Name:** | Fuller Middle School, Framingham, Massachusetts | **Project Phase:** | 90% Construction Documents |
| **Project Number:** | 17050 | **Reviewed Date:** | September 23, 2019 |
| **Document Reviewer:** | Mariana Hernandez, Robert Smith, John Hart, Paul Livernois, Christopher Davis, Robert Marshall, Rafael Gurevich, Stella Drizin, Patrick Weygint, and Joshua Delaplain-Zook | **Discipline** | All Disciplines |

## DESIGN REVIEW NOTES

| Item | Discipline | DWG/Spec | Design Development | | 60% Construction Documents | | 90% Construction Documents | |
|---|---|---|---|---|---|---|---|---|
| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 1. | Architecture | LS101-103 | Define the fire and smoke separation required for the 3-story atrium. | MSBC Section 404.6 required atrium spaces to be separated from adjacent spaces by 1-hour fire barriers in accordance with Section 707. A fire barrier is not required for this project as the building will include a smoke control system, which is currently being modelled by Howe Engineers using FDS.<br><br>Refer to the Atrium Design section of the Fire Protection and Life Safety Code Compliance Strategy report drafted by Howe Engineers. | A code compliance drawing should be included. Showing rated walls, separations construction type for ISP review. The Code Report is not typically submitted with Permit documents. | LS drawings include rated walls. A Life Safety Code Summary sheet will be included in the CD-90 submission. | Closed | |
| 2. | Architecture | LS101-103 | No reference shown to type of construction, allowable areas, etc. | The building is currently designed to be Type IB construction as noted on page 7 of the code report. | A code compliance drawing should be included. Showing rated walls, separations construction type for | LS drawings include rated walls. A Life Safety Code Summary sheet will be included in the CD-90 submission. | Closed | |

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| | | | | | ISP review. The Code Report is not typically submitted with Permit documents. | | | |
| 3. | Architecture | LS101 | Exit 6 is from a storage room, should not be counted towards egress totals. | The exit tag will be changed and updated in future submissions to indicate "Direct Exit" from the storage room. The exit will be called out on the Life Safety sheet, but will not be counted towards the overall egress totals. | Closed | | | |
| 4. | Architecture | LS103 | Some areas between corridor and atrium seem to be missing a railing | Railings will be provided on upper levels of the building. | Still appears to have missing railing at locations near breakout rooms. | Railings have since been provided. | Closed | |
| 5. | Architecture | A101-A103C | Provide overall dimensions, angles and working points | Dimensions will continue to be added | Open item | Dimensions will continue to be provided. A lot of the dimensioning will rely on a grid dimension layout plan. | Open | |
| 6. | Architecture | A101-A103C | Indicate partition types on plans | Tags will be added | Partially done, wall tags still missing. Ex 3134,3130,2160 | Tags will continue to be added. | Open | |
| 7. | Architecture | A101-A103C | Some structural grid lines are not appearing on the floor plans | Will continue to be coordinated | Open | Will continue to be coordinated. | Open | |
| 8. | Architecture | A101-A103C | Coordinate brace locations w/ openings, plumbing and HVAC ductwork | Will continue to be coordinated | Open | Will continue to be coordinated. | Open | |
| 9. | Architecture | A101-A103C | Reference enlarged toilet rooms back to floor plans. | Will continue to be developed | Open | Call outs to enlarged plans are included. | Closed | |
| 10. | Architecture | A101-A103C | Indicate ramp and stair direction | Will continue to be developed | Partially done, still needs additional direction arrows. | Notations will continue to be added. | Open | |
| 11. | Architecture | A101 | The interior finish notes mention a bubble skylight on the Auditorium ceiling, this skylight doesn't show on RCP or on Roof plans | Will be revised | Closed | | | |
| 12. | Architecture | A101 | Top right corner of Auditorium was cropped out from view | Will be revised | Closed | | | |
| 13. | Architecture | A101A | Exterior HM single egress door from Corridor 1020 | Door is now double door | Closed | | | |

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| | | | may need to be widened to accommodate reach required on a thick wall | | | | | |
| 14. | Architecture | A101B and A101C | Cohort Common and Learning Common are each 1'-0" off from the main floor elevation, provide cane detection per Code. | Measures have been added to meet code. | Closed | | | |
| 15. | Architecture | A101D | Room name missing from room facing exterior between Gym and Aud. | Will be added | Closed | | | |
| 16. | Architecture | A102A | Four apparent flues showing next to Closet 2017 seem in conflict w/ the walls and structure | Will continue to be coordinated in upcoming submissions. | Open | Will continue to be coordinated. | Open | |
| 17. | Architecture | A102B | Indicate HVAC elliptical duct risers and connection detail. | Will continue to be developed in upcoming submissions. | Open | Duct risers are now rectangular and enclosed in GWB partition. Details will be developed in upcoming submissions. | Open | |
| 18. | Architecture | A102B | Railing missing near Breakout room | Railings will be provided | Open, needs more refinement | Railings indicated, details in process. | Open | |
| 19. | Architecture | A1022B | East stair not showing | Will be fixed | Stair shown provide direction. | Tags will continue to be added. | Open | |
| 20. | Architecture | A102C | Ensure required door reach clearance at TP rooms typ. | Will continue to be refined to meet code. | Do you have 18" clearance on pull side of breakout 2068 | Required clearance provided. | Closed | |
| 21. | Architecture | A102D | How is the roof between Classroom 2224 and Auditorium drained? | With tapered insulation and roof drains. | Closed | | | |
| 22. | Architecture | A103A | Sunscreen image is confusing should be higher or not shown | Has been clarified | Closed | | | |
| 23. | Architecture | A103A | Roof south of Classroom 3144 shows as flat on the framing plans, coordinate with Structural drawings | Roof steel intended to be flat, insulation will be sloped. | Closed | | | |
| 24. | Architecture | A103B | Coordinate hanging post locations with bridge, indicate railing | Will continue to be coordinated in upcoming submissions. | Closed | | | |

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| 25. | Architecture | A104 | Indicate tapered insulation and how drain slopes will be achieved. Roof framing plans don't show sloping steel | Main drainage will be shown on the 100% DD set. | Open | Main drainage is shown on the roof plans. Main roofs use tapered insulation. Auditorium and gym roofs have sloped steel. | Additional drain slopes needed on A104 for lower roofs. | |
| 26. | Architecture | A104 | Indicate different roof levels and how different roof levels are accessed | Minor roof access will not be fully resolved for 100% DD set. | Open | Minor roof access at gym & auditorium will have access ladders. | Open, how do you access lower roofs. | |
| 27. | Architecture | A104 | Any roof ladders required to access the different roof levels? | An access ladder will be provided from the main roof level to the raised roof area at the skylights. | Open – not shown | Access ladders has been added to high roof | Closed | |
| 28. | Architecture | A104 | Indicate amount and layout of roof walk way pads | Walk Way pads will be indicated on the roof plan in the 100% set. | Partially done, consider all mechanical equipment needing servicing should have walkway pads | Additional walkway pads will be added | Open | |
| 29. | Architecture | A104 | Include view for stair and elevator roof. | Will be provided in the 60% DD set, | Closed | | | |
| 30. | Architecture | A-104 | Smoke vent hatches not shown on roof plans | Smoke vents will be shown at the auditorium only. | Open | Ongoing, smoke vents will be added. | Open | |
| 31. | Architecture | A104 | Indicate roof types, canopy construction | Roof types will be indicated in the 100% DD set. | Open | Roof Types have been added. | Open, Canopy construction needs further refinement | |
| 32. | Architecture | A104 | Show openings in Mechanical screen to allow access | Roof screen will allow for access at the line of the raised roof area 4'-0 clear. | Closed | | | |
| 33. | Architecture | A141A-A143C | Consider consolidating room finishes to one location. They are shown/ listed as a note on the A101 series, scheduled on these sheets and with room tags as well | Roof finishes will be consolidated to the A14 series | Closed | | | |
| 34. | Architecture | A141A-A143C | Show floor transitions for detailing | Floor transition details are indicated on door schedule | Partially done, show transition details where occur other than door locations. | Tags will continue to be added. | | |
| 35. | Architecture | A161A-A163C | Coordinate furniture locations with architecture. Ensure clearance around furniture and doors, walls, equip, etc. | Will be further developed in upcoming submissions | Partially done, charging carts, mobile furniture or makerspace equipment that are not yet shown on plans. | Additional furnishings will be included. Mobile Cabinetry is included in base project, ref: A622. | Open | |

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| 36. | Architecture | A181-A183C | Show HVAC diffusers, return grills and exposed ductwork | Will be further developed in upcoming submissions | Partially developed | Continues to be added to drawings. | Open | |
| 37. | Architecture | A181-A183C | Show light fixtures, sprinkler heads, smoke detectors, motion detectors, etc. | Will be further developed in upcoming submissions | Partially developed | Continues to be added to drawings. | Open | |
| 38. | Architecture | A181-A183C | Indicate ceiling elevations | Will be further developed in upcoming submissions | Needs further development, ceiling elevations missing or incorrect. Ex. Classroom 1244 | Tagging included. | Needs further refinement so tagging does not cover fixtures or symbols | |
| 39. | Architecture | A181-A183C | Show ceilings legend on all ceiling plans. | Will be further developed in upcoming submissions | Legends are shown but not all symbols are shown on ceiling plan legend. Ex. Smoke detector, motion detector. | Continues to be developed | Open | |
| 40. | Architecture | A181-A183C | In some areas exposed deck is shown with a line pattern, in other areas is shown blank show one consistent way. | Line pattern is meant to indicate a painted deck, will be clarified in upcoming submissions. | Has been clarified. Confirm classroom closet ceiling will have no finish. | Confirmed | Closed | |
| 41. | Architecture | A201 | Drawing is very hard to read. Consider highlighting cut areas and fading out planes behind | JLA will review. This drawing will be refined for 60% DD. | Drawing is easier to read but needs further refinement and detailing. | Will continue to refine | Open | |
| 42. | Architecture | A211-A217 | More detailed information and notes required, consider graphic refinement of patterns to provide more clarity Windows, CW and storefront need to be tagged, brick control joints need to be indicated. Applicable structural gridlines should show on the partial elevations. A key plan for the partial elevations may help in locating them. | JLA will review. A key plan will not be provided for the 100% DD set. | More refinement needed including brick control joints. | Drawings are being updated and modified per VM requirements and OPM/CMR review comments. | Open | |
| 43. | Architecture | A300 and A301 | Hard to read what is cut and what is beyond. Work w/ line weights. Label spaces, | JLA will review. This drawing will be refined for 60% CD set. | Partially refined, will cut rooms have room #'s to identify the space. | We will add room numbers | Open | |
| 44. | Architecture | A311- A320 | Wall sections not developed, need to show dimensions, exterior wall | Wall Section drawings will be further | Open, including additional drawings from A311-A326 | Drawings are being updated and modified per VM | Open | |





1000 Massachusetts Avenue
Cambridge, MA 02138
T 617.547.5400 F 800.648.4920
www.smma.com

275 Promenade Street, Suite 275
Providence, RI 02903
T 401.421.0447

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| | | | and roof types, indicate insulation and AVB continuity, roof edge treatments, flashing conditions, sun screen structure, overhang structure and insulation criteria, how ceilings meet with exterior walls, windows | developed for 100% DD. | needing further development. | requirements and OPM/CMR review comments. | | |
| 45. | Architecture | Floor plans | Confirm door reach clearance on both pull and push side, on the Break Out spaces | Will continue to be refined to meet code. | Open | Door clearances provided. | Closed | |
| 46. | Architecture | Specs | Specs indicate precast concrete and none shown on drawings. | There is no precast concrete in the project. This section will be removed. | Drawings call for a precast planter on drawing A102A. As well as precast stair treads. | These planters are now cast in place | Drawing A102A still indicates precast planters. | |
| 47. | Architecture | Specs | Specs call for mineral wool insulation, drawings show Polyiso | The intent is to use both types of insulation Pending confirmation of final detailing for masonry walls. Polyiso is preferred for masonry veneer walls. | Open | The intent is to use both types of insulation Pending confirmation of final detailing for masonry walls. Polyiso is preferred for masonry veneer walls. | Drawings indicate mineral wool in some masonry walls between windows. | |
| 48. | Architecture | Specs | Drawing A501 shows Concrete Unit Masonry block w/ insulated cores. There is no mention of it in the specs | Insulated CMU has been removed from the project based on CM cost analysis. | Closed | | | |
| 49. | Architecture | Drawing Index | | | A001 drawing not present. | Will be included | Closed | |
| 50. | Architecture | Drawing Index | | | Add drawing to indicate toilet fixture and accessories mounting heights. | Will be included | Closed | |
| 51. | Architecture | LS101 | | | Does the number of seats in the Gymnasium take into consideration ADA seating? Non shown. | Yes | Closed | |
| 52. | Architecture | LS101 | | | If gymnasium and auditorium both have after hours permits for events are there a sufficient number of toilet fixtures to | Yes | Closed | |

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| | | | | | accommodate all occupants. | | | |
| 53. | Architecture | A101A | | | No door number tag on doors to room 1134. | Tag has been added | Closed | |
| 54. | Architecture | A101A | | | Kitchen serving countertop indicates PLAM on drawings. Specifications indicate Quartz stone countertop | Will be coordinated in upcoming submissions. | Closed | |
| 55. | Architecture | A101C | | | Is there a separate plan for the loading dock? | No | Will details be provided for loading dock bumper pads? | |
| 56. | Architecture | A102A | | | Provide additional detail and dimensioning of precast planter and railing connection. | Will be further developed | Open | |
| 57. | Architecture | A102A | | | Provide additional detail and dimensioning of wood slat seating. | Will be provided in upcoming submissions | Open | |
| 58. | Architecture | A102A | | | Provide additional detail and dimensioning for phenolic bench with slopped back. | Will be provided in upcoming submissions | Open | |
| 59. | Architecture | A101-A103 | | | Classroom dividing walls indicate both a wall type F6 and a folding partition. | That is correct | Closed | |
| 60. | Architecture | A102A | | | No door tag on closet 2017. | Will be provided | Closed | |
| 61. | Architecture | A102A | | | Should the flues in chase behind closet 2017 be in a rated shaft. | Yes, we will revise. | Partition type not called out. | |
| 62. | Architecture | A103A | | | Room # missing from A3134. | Will be provided | Open | |
| 63. | Architecture | A104 | | | Provide additional drawings indicating roof and edge details. | These are included on exterior wall sections | Included but need further refinement and detailing. | |
| 64. | Architecture | A11A-A113C | | | EOS Legend does not match hatched out areas on floor plans. | EOS Legend updated in Early Concrete & Steel Package 8/9/19 | Closed | |
| 65. | Architecture | A11A-A113C | | | Include EOS legend on all pages. | EOS Legend updated in Early Concrete & Steel Package 8/9/19 | Closed | |

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| 66. | Architecture | A141A-A143C | | | Not all abbreviations are included on legend. Needs further refinement. | Will be further refined in upcoming submissions | Open, example floor finish “LP” not indicated. | |
| 67. | Architecture | A141A-A143C | | | Legend indicates power troweled concrete-should that be polished concrete to coincide with specifications. | Specs will be revised to power troweled concrete | Closed | |
| 68. | Architecture | A201 | | | Remove curtainwall from elevations. | Notes will be deleted | Closed | |
| 69. | Architecture | A221 | | | Is there a window type D2? | Not at this time | Closed | |
| 70. | Architecture | A311-A326 | | | Need further refinement and detailing. Ex. Drawing refer to a details on drawing A511 that has not been developed. | Drawings are being updated and modified per 60% VM requirements | Open, drawing need further refinement, labeling and detailing. | |
| 71. | Architecture | A400 | | | Call out glazed partition with gradated pattern on details 4&5. | Additional notation included. | Closed | |
| 72. | Architecture | A400 | | | Elevation #7 needs further refinement and labeling. | Additional information included. | Closed | |
| 73. | Architecture | A403 | | | Elevation #12 needs further refinement and labeling. | Additional information to be provided | Open | |
| 74. | Architecture | A404 | | | Elevation #7 needs further refinement and labeling. | Additional information to be provided | Open | |
| 75. | Architecture | A404 | | | Call out plumbing fixtures on elevation #5. | Drinking Fountains are keynoted | Closed | |
| 76. | Architecture | A405 | | | Elevations #2&7 need further refinement and labeling. | Additional information to be provided | Open | |
| 77. | Architecture | A406 | | | Elevations need further refinement and labeling. | Additional information to be provided | Open | |
| 78. | Architecture | A400-A406 | | | Drawings should include keynotes and legends. | Legends to be included, Elevations are keynoted. | Open | |
| 79. | Architecture | A410 | | | Elevations need further refinement Elevation#6 calls out paint on door glass, elevation #5 has | Tagging to be refined. | Open | |

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|---|---|---|---|---|---|---|---|---|
| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| | | | | | exterior glazing arrow pointed to nothing. | | | |
| 80. | Architecture | A410-A416 | | | Is there a detail on supporting sink counter if cabinet bases are mobile on casters? | Additional information to be provided | Open | |
| 81. | Architecture | A420-A442 | | | It might be beneficial to have a plumbing legend on these drawings. | Additional information to be provided | Open | |
| 82. | Architecture | A425 | | | Detail for PLAM work Counter in center of admin office 2010. | Additional information to be provided | Partially done needs refinement | |
| 83. | Architecture | A430 | | | Detail #2 railing does not connect to breakout room. | Railings included; Additional information to be provided | Partially done needs refinement | |
| 84. | Architecture | A431 | | | Details #2&#3 Locker/railing detail unclear at connection to breakout room | Additional information to be provided | Partially done needs refinement | |
| 85. | Architecture | A430-A433 | | | Breakout elevations need further labeling and dimensioning. | Additional information to be provided | Open | |
| 86. | Architecture | A450 | | | Indicate duct risers in gymnasium and connection details. | Additional information to be provided | Open | |
| 87. | Architecture | A450 | | | Is there enough space for a timekeepers table for basketball and volleyball games? | Yes, First row of bleachers retractable to accommodate scoring table. | Closed | |
| 88. | Architecture | A450 | | | Gymnasium game lines need dimensioning. Will any graphics be included (school mascot or name of school). | Additional information to be provided | Open | |
| 89. | Architecture | A451 | | | All tag callouts are not indicated on keynote legend. | Additional information to be provided | Open | |
| 90. | Architecture | A452,A453 | | | Should basketball shot clocks be shown above main court backboards. | This is a spec item | Closed | |
| 91. | Architecture | A460-A463 | | | Callout auditorium stage curtains. Also mounting between stage curtains b | Note will be added | Open | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 92. | Architecture | A461 | | | Will standard sprinkler connection with concealed plate apply to clouds or is sprinkler head exposed? | Sprinkler heads will be exposed | Closed | |
| 93. | Architecture | A470 | | | Show arrows with stair direction. | Additional information to be provided | Open | |
| 94. | Architecture | A470 | | | Indicate finishes example handrails are they painted? | Additional information to be provided | Closed | |
| 95. | Architecture | A470 | | | Indicate large details and connection details. Example railing at top landing looks unfinished. | Additional information to be provided | Open | |
| 96. | Architecture | A470 | | | Reference all details on A652 | References have been added | Closed | |
| 97. | Architecture | A471 | | | Are metal risers and side stops indicated to be painted? | Additional information to be provided | Closed | |
| 98. | Architecture | A471-A473 | | | Will matching wall base be applied to GWB below stairs | Yes, will be added to drawings | Open | |
| 99. | Architecture | A471-A473 | | | Will additional dimensioning be added for posts between perforated panels. | Yes, dimensions will be added. | Open | |
| 100. | Architecture | A480 | | | Layout of elevator equipment should be included in elevator mechanical room. | Reference VT01 for elevator and elevator mechanical room layout. | Closed | |
| 101. | Architecture | A480 | | | Will an elevator sill detail be provided? | Additional information to be provided | Open | |
| 102. | Architecture | A480 | | | Should corridor floor finish be identified on elevator sections? | Sill detail to be provided. | Open | |
| 103. | Architecture | A502 | | | Provide additional roofing details. | Additional roofing details will be provided at 90%. | Open | |
| 104. | Architecture | A540 | | | Will a skylight end detail be provided? | End detail will be provided at 90%. | Open | |
| 105. | Architecture | A540 | | | Provide additional detail and description to skylight edge section detail. | Additional details will be provided | Open | |
| 106. | Architecture | A570 | | | Canopy details need more refinement to | Drawings are being updated and | Open | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| | | | | | show connections, dimensions and materials. | modified per 60% VM requirements | | |
| 107. | Architecture | A600-A625 | | | Need additional refinement indicating reference details, dimensioning and details. | Additional information to be provided. | Open | |
| 108. | Architecture | A621 | | | Should show a dimensioned plan view of bench in corridors | Refer to 10/A600 | Closed | |
| 109. | Architecture | A650 | | | Detail 7, Section-Guardrail locker. Is additional metal framing necessary to install GWB soffit? | No | What does ACT wall trim anchor into? Detail appears trim is floating | |
| 110. | Architecture | A651 | | | Stair detail indicates both precast stair tread and metal pan with concrete fill. | This note has been revised in PR 12. | Closed | |
| 111. | Architecture | A651 | | | Details need further refinement and coordination to | Details have been further developed. | Open-Detail 1 angle iron at top rail shows recessed into ½"x3" steel plate. Should sit on top of flat plate to match bottom steel angle. | |
| 112. | Architecture | A652 | | | Stair detail indicates both precast stair tread and metal pan with concrete fill. Detail #7&12. | This note has been revised in PR 12. | Closed | |
| 113. | Architecture | A652 | | | Interior stair details with ½"x3" steel stanchion. Is this within reach of students and should it be rounded instead of square edge | Square edges will be eased | Closed | |
| 114. | Architecture | A690 | | | Some details need further refinement | Ongoing | Open | |
| 115. | Architecture | A690 | | | Is there a mounting detail for the chain of the roller shade? | This is a spec item, it will be mounted to the wall with a holder. | Closed | |
| 116. | Architecture | A690 | | | Is addition vertical metal framing required for sloped ACT to GWB Soffit at Corridor. | No, slope is within range for standard ACT ceiling application. | Closed | |

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| 117. | Architecture | A691 | | | Should a ceiling legend be included on this drawing for reference. | We do not typically do this. | Closed | |
| 118. | Architecture | A691 | | | The wood trim piece covering the anchor for the cloud, is this piece a custom turned piece or supplied from manufacturer. If custom provide additional details. | Wood trim would be custom millwork piece. Detail 5/A691 shows dimensions. | Closed | |
| 119. | Architecture | A700 | | | Partition type “D6” indicates a 7 ¼” wall thickness with a 3 5/5” stud. | Has been revised | Closed | |
| 120. | Architecture | A700 | | | Partition type “H6” indicates a 7 ¼” wall thickness with a 3 5/5” stud. | Has been revised | Closed | |
| 121. | Architecture | A715 | | | Is there any exterior signage details? | Will be provided in upcoming submissions | Open | |
| 122. | Architecture | Drawings | | | Provide mechanical enclosure on roof elevations and details. | Detail Section has been added, elevations will be provided. | Open | |
| 123. | Architecture | Drawings | | | Show calculations and counts of toilet fixtures. | Plumbing fixture requirements included in Code Report and will be included on Code Summary sheet in upcoming submissions. | Closed | |
| 124. | Architecture | Drawings | | | Details are hard to follow without callbacks or reference to locations on plans where they apply. | Additional tagging in progress. | Open | |
| 125. | Architecture | Plumbing P101A | | | Indicates to refer to P202 for enlarged kitchen plan. | These are plumbing comments with an Architectural discipline designation | Agreed, want to make sure they a coordinated. | |
| 126. | Architecture | Plumbing P002 | | | Detail 7 indicates a 6” water service please verify with site utilities changes. | These are plumbing comments with an Architectural discipline designation | Agreed, want to make sure they a coordinated. | |
| 127. | Architecture | Spec Section 03 35 10 | | | Should the application include the procedure | Polished concrete is no longer on the job. | Closed | |

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| | | | | | to repair any hairline cracks in concrete surface to receive polished concrete. | Limited areas of exposed concrete are power troweled and sealed. | | |
| 128. | Architecture | Spec Section 06 40 00 | | | Subsection 3.4 Installation -casework and countertops. Should you include after installation applying a continuous bead of specified sealant to all joint which abut walls or partitions. | See 064000 pg 19 3.4F. Section 079200 will provide these sealants. | Closed | |
| 129. | Architecture | Spec Section 07 00 02 | | | Page 2 Subsection 1.2.H has Question (?) marks for all listed drawing numbers. | Drawings will be finalized for 100% CDs or any related early bid package. | Open | |
| 130. | Architecture | Spec Section 07 54 19 | | | Section 1.7 Quality Assurance. Roofing manufacturer's representative should be onsite during roofing installation and not just provide a final inspection. | Agreed, will revise. | Closed | |
| 131. | Architecture | Spec Section 08 14 16 | | | Section 2.3.A.2.a. 1) Wood Species and cut indicated as "xxx". Please indicated species and cut. | Will be provided as white maple | Open | |
| 132. | Architecture | Spec Section 08 14 16 | | | Should you indicate wider width of top and bottom rails that have closers and lock blocks at door stiles with exit devices. | Stiles are indicated on drawings. | Closed | |
| 133. | Architecture | Spec Section 08 34 57 | | | Can more than 1 manufacturer be specified. | Yes, will add | Closed | |
| 134. | Architecture | Spec Section 08 35 15 | | | Can more than 1 manufacturer be specified. | Section has been removed | Closed | |
| 135. | Architecture | Spec Section 08 45 13 | | | Can more than 1 manufacturer be specified. | Yes, this has been added | Closed | |
| 136. | Architecture | Spec Section 09 91 00 | | | Should joint sealants be specified at locations were GWB | This is covered in section 079200 | Yes, concern with interior metal door frame and floor | |

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| | | | | | comes in contact with metal frames, sills, countertops, casework. Or at locations were metal frames come in contact with flooring but has a gap from shimming frame. | | when door frame has floor spacers for shimming due to floor unevenness. | |
| 137. | Architecture | Spec Section 09 91 00 | | | Will exterior doors be numbered and painted with stencils? | We will use an applied film. Numbing system will need to be reviewed at upcoming Fire Department meeting | Open | |
| 138. | Architecture | Spec Section 11 53 00 | | | Has wrong page numbering and section at bottom of pages | Will be revised. | Open | |
| 139. | Architecture | Spec Section 11 53 13 | | | Has wrong page numbering and section at bottom of pages | Will be revised. | Open | |
| 140. | Architecture | Spec Section 12 35 53 | | | Has wrong page numbering and section at bottom of pages | Will be revised. | Open | |
| 141. | Architecture | Spec Section 12 36 53 | | | Has wrong page numbering and section at bottom of pages | Will be revised. | Open | |
| 142. | Architecture | Spec Section 12 61 00 | | | Section 12 61 00 subsection 2.2 B. refers to City of Boston Fire Prevention Code. | Will be revised. | Open | |
| 143. | Architecture | Spec Section 12 61 00 | | | Section 12 61 00 subsection 2.3 D.1. refers to City of Boston Fire Marshal. | Will be revised. | Closed | |
| 144. | Architecture | Drawing G101 | | | | | Indicates location of 2 exterior Acid Neutralization tanks that have been eliminated. | |
| 145. | Architecture | A101A | | | | | Should there be a notation/callout on this plan indicating see FS-001 plans. | |
| 146. | Architecture | A101A | | | | | Is their an automatic H.C. door release/hold open for entering and exiting main entrance. | |

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| 147. | Architecture | Drawing A102D | | | | | Needs key plan | |
| 148. | Architecture | Drawing A104 | | | | | Keynote legend for Roof. | |
| 149. | Architecture | Drawing A104 | | | | | What type of roof finish is located at roof by Chimney flues. | |
| 150. | Architecture | Drawing A104 | | | | | Scupper note indicated on Gridline N12 but not drawn into edge of roof. | |
| 151. | Architecture | Drawings A113A, A113D, A114C ,A114B | | | | | Should roof drains cut outs be shown on EOS roof Drawings. Roof Drain Bowls should be set to prevent chipping concrete out to recess bowls. | |
| 152. | Architecture | Drawing A141A | | | | | Finish Schedule indicates -/PTD is that symbol different than PTD symbol. | |
| 153. | Architecture | Drawing A141A | | | | | Roof finish schedule indicates corridor 1000A and Kitchen Scramble 1001 but not shown on floor plans. | |
| 154. | Architecture | Drawing A141C | | | | | Lockers outside of Art room indicate dimension of 4’-8” and a locker quantity of 5 cannot be achieved. | |
| 155. | Architecture | Drawing A142B | | | | | Lockers outside of Room 2038 indicate dimension of 1’-7” and a locker quantity of 5 cannot be achieved. | |
| 156. | Architecture | Drawing A142B | | | | | Lockers outside of Room 2120 indicate dimension of 1’-7” | |

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| | | | | | | | 203/256" and a locker quantity of 2 cannot be achieved. | |
| 157. | Architecture | Drawing A181A | | | | | 1134 has (3) locations with B$ indicated below Acoustical panel Ceiling? | |
| 158. | Architecture | Drawing A181A-A183C | | | | | Coordinated lighting, O.S. and PS with sprinkler head layout. | |
| 159. | Architecture | Drawing A200 and A201 | | | | | Note#5 indicates Curtainwall system. | |
| 160. | Architecture | Drawing A400 | | | | | Drawings need further refinement. See detail 12, doors are cut off. Detail #2 has section cuts on top of each other. | |
| 161. | Architecture | Drawing A400 | | | | | Detail 10 has section cut indicating see detail 1 on Drawing A514. Drawing A514 does not exist. | |
| 162. | Architecture | Drawing A480 | | | | | Should proximity card locations on corridor side be dimensioned on plan for location. | |
| 163. | Architecture | Drawing A480 | | | | | Should proximity card reader be located on detail 10 inside cab. | |
| 164. | Architecture | Drawing A490 | | | | | Detail #7, Drawings indicate 1/8" sawcut joint in stair treads. How do you make this cut without damaging riser with saw. | |
| 165. | Architecture | Drawing A491 | | | | | Has lintel detail on drawing that should be removed | |
| 166. | Architecture | Drawing A491 | | | | | Detail 1, needs further refinement. Unfinished. | |

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| 167. | Architecture | Drawing A510 | | | | | Detail 8 & 9 does the 3/8" joint get caulked between WT8 and WT10. | |
| 168. | Architecture | Drawing A510 | | | | | General note Wall types to not fit in call out boxes. Drawing needs refinement | |
| 169. | Architecture | Drawing A511 | | | | | Detail #6 metal stud on outside corner beyond concrete slab. How is it attached. | |
| 170. | Architecture | Drawing A511 | | | | | Detail 6 how does wood blocking for attach to metal studs. | |
| 171. | Architecture | Drawing A511-A513 | | | | | Details need further refinement. | |
| 172. | Architecture | Drawing A513 | | | | | Detail #2, After metal framing corner appears to need addition reinforcement or blocking to anchor board and masonry anchors. | |
| 173. | Architecture | Drawing A520, A521, A531, A542 | | | | | Roof edge metal facia should lay flat on top of roof with flashing strip hot-air welded over seam. | |
| 174. | Architecture | Drawing A520 | | | | | Detail #12 indicates wood "SundHade" should this be wood grilles. | |
| 175. | Architecture | Drawing A520, A521, A522 | | | | | Needs further refinement and detailing. | |
| 176. | Architecture | Drawings A520-A522 and A542 | | | | | Shows rim board. Specs indicate that sizes are indicated on drawings. Provide dimensions or rim board schedule. | |

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| 177. | Architecture | Drawing A531 | | | | | More refinement is needed on edge details. | |
| 178. | Architecture | Drawing A540 | | | | | Provide skylight panel spacing dimensions. | |
| 179. | Architecture | Drawing A541 | | | | | Detail #2 GWB does not appear to be continuous and cuts off fire proofing from I-Beam. | |
| 180. | Architecture | Drawing A541 | | | | | Detail #3 does sprinkler pipe being attached to skylight structure affect manufacturer warrantee. | |
| 181. | Architecture | Drawing A541 | | | | | Detail 1- Elastomeric flashing arrow points towards rigid insulation. | |
| 182. | Architecture | Drawing A541 | | | | | Additional labeling of roofing materials, PPT plywood, cants, ect..= | |
| 183. | Architecture | Drawing A542 | | | | | Details 1&3 PLAM extends beyond metal flashing. | |
| 184. | Architecture | Drawing A542 | | | | | Additional refinement and dimensioning of edge facia metal | |
| 185. | Architecture | Drawing A544 | | | | | Details 12&13 indicates prefab curb section 23 00 00. They are to be poured by concrete subcontractor. | |
| 186. | Architecture | Drawing A544 | | | | | Detail 13 has a ? for a description. | |
| 187. | Architecture | Drawing A544 | | | | | Detail 7 should have a minimum dimension for the location of Thru wall flashing in case coursing if off. | |
| 188. | Architecture | Drawing A600 | | | | | Detail 10, at the intersection of the | |

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| | | | | | | | glazed partition with the wrapped beam the interior joint appears to be approx. 1". Provide larger detail of how it is anchored and finished on the interior side. | |
| 189. | Architecture | Drawing A623 | | | | | Media center and Admin desks, will they require any additional leg stanchions or brackets to support countertop. | |
| 190. | Architecture | Drawing A625 | | | | | Detail 5 concerns that concealed alum. Glazing shoe is recessed to far into receiver and glass will rest on blocking. | |
| 191. | Architecture | Drawing A625 | | | | | Detail 5 Linoleum base molding arrow points to GWB | |
| 192. | Architecture | Drawing A625 | | | | | Detail 5 Consider additional blocking to anchor GMW at angle into. | |
| 193. | Architecture | Drawing A625 | | | | | Details need further refinement. | |
| 194. | Architecture | Drawing A650 | | | | | Details 2, 3,4,8&9 have a section cut 2/A300 thru detail that should be removed. | |
| 195. | Architecture | Drawing A650 | | | | | Details 4&5 blocking for phenolic lockers should be continuous horizontally at a predetermined height for installation. | |
| 196. | Architecture | Drawing A651 | | | | | Details refer to Atrium stair and Cohort Stairs- | |

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| | | | | | | | Should you refer to stairs by number so there is less chance for discrepancies. | |
| 197. | Architecture | Drawing A651 | | | | | Detail 1&2 indicates precast concrete stairs treads but shows poured in place. | |
| 198. | Architecture | Drawing A651 | | | | | Detail 1 top of c-Channel has dashed circle with not indication or call out. | |
| 199. | Architecture | Drawing A652 | | | | | Detail 12 depicts precast concrete stair treads, but call outs indicate both precast and concrete filled. | |
| 200. | Architecture | Drawing A652 | | | | | Detail 2 indicates precast stair treads. | |
| 201. | Architecture | Drawing A652 | | | | | Detail 6 has arrow indicating GWB, PTD but pointed to space. | |
| 202. | Architecture | Drawing A652 | | | | | Detail 3 correct spelling of stair / Floor side. | |
| 203. | Architecture | Drawing A652 | | | | | Detail 7 indicates precast concrete tread but depicts concrete filled. | |
| 204. | Architecture | Drawing A690 | | | | | Detail 6, How is the bottom of the GWB being attached and what are you anchoring the corner bead into. | |
| 205. | Architecture | Drawing A690 | | | | | Detail 5, at intersection into T-1 ¾” wall molding what supports wall molding. Tie wire? | |
| 206. | Architecture | Drawing A691 | | | | | Detail 8 needs further refinement. Has ? for 2 of the callouts. | |

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| 207. | Architecture | Drawing A700 | | | | | Partition D6- has 6" stud should have 5 ½" batt insulation | |
| 208. | Architecture | Drawing A700 | | | | | Partition H6- has 6" stud should have 5 ½" batt insulation | |
| 209. | Architecture | Drawing A700 | | | | | Partition C6- has 6" stud should have 5 ½" batt insulation | |
| 210. | Architecture | Drawing A700 | | | | | Partition details D&M have large dashed line going thru detail. | |
| 211. | Architecture | Drawing A710 | | | | | Door 1065A exterior door from stair 2 should that have security film as well as all other exterior storefront glazing. | |
| 212. | Architecture | Drawing A710 | | | | | Door Schedule Comment "EL" is not on door abbreviations. | |
| 213. | Architecture | Drawing A710 | | | | | Only details SF3 & SF4 indicate security glazing. Should be on all exterior doors with glazing. | |
| 214. | Architecture | Drawings | | | | | Drawing E300 shows plywood on electrical and IDF rooms by G.C. – Should be a note on Architectural drawings or it should refer you to the electrical drawings. | |
| 215. | Architecture | Drawings | | | | | Where are the interior wood grilles located? Locate on floor plans or provide schedule. | |
| 216. | Architecture | Drawings | | | | | Will you be providing standard masonry details indicating joint | |

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| | | | | | | | finish. Flush, concave, etc…. | |
| 217. | Architecture | Drawings | | | | | Show location and dimensions of any exterior Knox box and card reader locations around perimeter of school in masonry. | |
| 218. | Architecture | Drawings | | | | | Masonry should provide detail of end dams or specify turn up dimensions. | |
| 219. | Architecture | Drawings | | | | | Will Defibrillators and cabinets be located on plans. | |
| 220. | Architecture | Drawings | | | | | Will there be Theater drawings issued note on drawing A460 references Theater Drawings. | |
| 221. | Architecture | Drawings | | | | | Will there be an exterior Mock up detail drawing issued. | |
| 222. | Architecture | Spec. Section 072100 | | | | | Page 1 indicates curtainwall but not in current project. | |
| 223. | Architecture | Spec Section 072100 | | | | | Rigid insulation at perimeter of foundation walls and under slab is by Concrete subcontractor. | |
| 224. | Architecture | Spec Section 1248132 | | | | | Has wrong page numbering. | |
| 225. | Architecture | Specs | | | | | Spec has numerous section that refers to Curtain wall system including Masonry, Cold Metal Framing, Rough Framing | |
| 226. | Civil | All | Include Legends for all series of plans. | Legends will be included in 100% DD | Abbreviations are provided, but not comprehensive legends. | Additional legends were added to C4.0,C5.0 and C.6.0 | Closed. | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 227. | Civil | All | Include detail references. | Detail references will be included in 100% DD | No detail callouts are provided on Civil Plans. | Detail references added | Closed. | |
| 228. | Civil | C-0.1 & 0.2 | Include parking stripes for clarity | Existing spaces were not surveyed | Closed | | | |
| 229. | Civil | C-1.0, 2.0 & 3.0 | Phase 1 Notes: Note 1 – Clarify? Note 2 – Fence Limits are unclear & not in legend., Note 4 – Nothing shown as bold | Items to be demo are shown in bold (darker than other existing items). Fence is called out on plan. | Closed | | | |
| 230. | Civil | C-1.0, 2.0 & 3.0 | Clarify the disposition of utilities within demo areas. Remain, remove, abandon, cut/cap, etc. | Items in bold are to be demo'd. | Closed | | | |
| 231. | Civil | C-1.0, 2.0 & 3.0 | Identify salvage items. | No items have been identified to be salvaged. | Closed | | | |
| 232. | Civil / LA | C-1.1 & L1.2 | Civil and LA indicate different parking layouts, curbing, striping and sidewalk materials | Will coordinate Civil / LA | Closed | | | |
| 233. | Civil | C-1.1 | Does Phase 1 construction include both binder and wearing course? If just binder, striping will be done twice, & structures reset, this needs to be noted. | Pavement detail calls for only binder on temp parking areas. Temp striping and structure reset, will be based on CM's paving schedule. | Closed | | | |
| 234. | Civil | C-1.1 | Reconsider using SGC directly against sidewalk on west side of parking lot. Coordinate Phase 3 Fire Access Road with sidewalk and curbing. | Revisions have eliminated SGC, and most of the curb. | Closed | | | |
| 235. | Civil | C-1.2 | DMH3 indicates a stub for Phase "4", not Phase 3 | Revised to indicated P3. | Closed | | | |
| 236. | Civil | C-1.2 | Consider a filter strip or stone apron at north edge of parking with no curb. | A grass and gravel filter strip was shown | Closed | | | |
| 237. | Civil | C-1.3 & 2.3 | No utility text/callouts are indicated. Pipe sizes etc. | Proposed sizes are shown, see MEP plans for additional info & sizing not called out. | Closed | | | |

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| 238. | Civil | C-1.4 | Clarify limits of pavement, binder or full depth asphalt. | Pavement detail calls for only binder on temp parking areas. | Closed | | | |
| 239. | Civil | C-2.x | Clarify limits of Phase 1 and Phase 2 work on Phase 2 drawings. | Phasing plans were updated based on Consigli's phasing. | Closed | | | |
| 240. | Civil | C-2.3 & C-6.x | Clarify if utilities are in Phase 2 or Phase 3, no roof drains shown. | C-2.3 shows the utilities to be installed for P2. Roof drains are shown. | No further comment, see new comments. | | | |
| 241. | Civil | C-2.3 | Has City Fire and Water Depts approved a 600'+ dead end water pipe for the hydrant to the north? | Its been reviewed, CDW is not aware of a requirement to loop the main. | Closed | | | |
| 242. | Civil | C-2.3 & C-6.1 | Coordinate building utilities and roof drains | Roof drains are shown. Bldg. utilities will continue to be coordinated. | See new comments, coordination not complete. | Building utilities and roof drains have been further coordinated. | Closed. | |
| 243. | Civil | C-3.0 | Is entrance drive constructed at the end of Phase 2 or in Phase 3. | The construction entrance is for P2. | Not shown on Civil Phase 2 plans | A construction entrance is shown on P2 C2.0 | Closed. | |
| 244. | Civil | C-3.0 | Define Phase 3 enabling and/or temporary work. | P3 is the demolition of the exist bldg | Closed | | | |
| 245. | Civil / LA | C-4.X & L | Coordinate sidewalk locations, curbing and striping. | Plans have been revised. | Closed | | | |
| 246. | Civil | C-4.1 | Are gates proposed for the Fire Access Road? | Gates are shown. | Closed | | | |
| 247. | Civil | C-4.1 | Review loading geometry with truck turning movements | Loading area revised. | Closed | | | |
| 248. | Civil | C-5.X | Has it been Closed that no stormwater recharge is required for the project? | Recharge is required, plans have been updated. | Closed | | | |
| 249. | Arch/Plumb/ Civil | C-6.1 | Is the FDC located in the raised main entrance plaza? Is this acceptable. | Yes, and a hydrant is shown within 100-ft of the entrance. | Closed | | | |
| 250. | Civil | C-7.2 & 7.3 | Repeated and conflicting details on these 2 sheets. | Has been revised | Closed | | | |
| 251. | Landscape | | Building Footprint does not match Arch or Civil dwgs. | Will be coordinated | Closed | | | |
| 252. | Landscape | | Coordinate drainage system structures with civil. | Will be coordinated | Closed | | | |
| 253. | Landscape | | Show light poles on all enlargements and Planting Plans for coordinating design. | Light Poles will be shown. | See new comments to coordinate locations with Electrical | OK | Closed. | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 254. | Architecture | Specifications | TOC is missing 320000 & 329000, headers are not consistent throughout. | Will be revised. | No further comment | | | |
| 255. | Civil | Specifications | Check that cross-referenced sections are included. | Will review and revise as necessary. | No further comment | | | |
| 256. | Civil | Specifications | Storm Drainage piping materials do not match what is on plans. | Piping on plans and specs is a mix of HDPE, PVC, and RCP. | No further comment | | | |
| 257. | Civil | | | | No Detail callouts are provided. | Detail callouts have been added | Closed. | |
| 258. | Civil | C-4.1 | | | No details for retaining walls either side on building entrance. | A generic detail is provided, final detail to be by wall manufacturer | Closed. | |
| 259. | Civil | C-4.1 | | | Provide concrete pads at building exterior doors, and walkways where needed. | Concrete pads shown | Closed. | |
| 260. | Civil | C-4.1 | | | Building doors at rear center are not coordinated with Architecture | Building doors updated | The door out of the Art Room appears to be shown in differing locations. | |
| 261. | Civil | C-4.1 | | | Is there a solution to the fire access road being so close to the building in 2 locations due to the 50' wetland setback and the width of the road? | The building wall has shifted further south | Closed. | |
| 262. | Civil | C-4.x | | | Additional layout & dimensioning needed | Has been further developed | Closed. | |
| 263. | Civil | C-5.1 | | | An enlarged grading plan with spot elevations for the entire front entry loop would be very helpful. | Grading of the amphitheater and loop area is still ongoing. Specifically, the amphitheater area was layout and graded by the LA | Further detail and spot elevations will clarify critical areas like entry, ramps, walls, intersections, etc. A 165 contour is missing north of amphitheater. | |
| 264. | Civil | | | | Add Generator, adjust Transformer | Generator and transformer pads added | Clarify grading & dimensions/location | |
| 265. | Civil / FP / Plumbing | C-6.1 / FP101A / P101A | | | Coordinate size and location of Fire Protection Service. | Size and locations coordinated | Closed. | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 266. | Civil / Plumbing | C-6.1 / P100A-C | | | Coordinate size, location and inverts of roof drains, water service and gas service | Size, locations, inverts coordinated | Plumbing exits perpendicular, site is angled, coord & show as intended and add cleanouts where needed. | |
| 267. | Civil / Plumbing | C-6.1 / P100A | | | Show size, detail and invert information for grease trap & SMH between GT & building. Indicate contract limits as done for Acid NT between Plumbing & Civil. | Grease trap and the SMH between GT and the build will be detailed by plumbing at it falls under plumbing code. | Plumbing did not show on 90%, and their drawing say by Div. 33 after 10'. Info previously shown for SMH-1,2 & 3 on C-6.1 and C-6.2 is missing on 90% | |
| 268. | Landscape | L1.1 | | | Dimension & locate fields and BB Court. | Dimensions will be added at 90%CD | Closed. | |
| 269. | Landscape | L1.1 | | | What is 2' wide strip at north edges of pavement in loading area? | This should be part of the planting bed. Drawing will be corrected. | Closed. | |
| 270. | Landscape / Civil / Architecture / Electric | L1.3 | | | Coordination of items referenced in other disciplines: Entrance Plaza, Guard Rail, Concrete Ramps, Concrete Pavers, CIP & Unit Block Retaining walls, Pavilion, and lighting. | The landscape materials plan does call out items and reference the other disciplines. We will continue to coordinate. | Closed. | |
| 271. | Landscape | L1.3 | | | Provide Detailed Layout information and dimensioning. | Dimensions will be added at 90%CD | Closed. | |
| 272. | Civil | C-1.1 | | | | | Site lighting poles should be shown for coordination, as they are for the other phases. | |
| 273. | Civil | C-1.4 | | | | | Label headwalls (HW-1 & HW-2) to correspond with details 2/C-7.2 and 10/C-7.3. | |
| 274. | Civil | C-5.1 | | | | | Is there an outlet detail for the roof drains as they discharge into the stormwater basins? | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 275. | Civil | C-2.3 | | | | | The sewer connection reference to C-4.0 should be C-6.1?? | |
| 276. | Civil | C-6.1 | | | | | Indicate clear routing of utilities east of main entrance. Many utility crossings. | |
| 277. | Civil | C-7.1 | | | | | Detail 5 indicates 3 feet of "soil Media" for bio-cell & trees and shrubs. Only 2 trees appear to be in bottom of basins. Does this 3 feet cover the entire bottom of the basins? Define limits or correct detail. | |
| 278. | Civil / Architecture | C-7.6 / A490 | | | | | Detail 2 on C-7.6 indicates a different top of wall treatment than 3/A490 | |
| 279. | Landscape / Architecture | L1.6 | | | | | Landscape drawing says the exterior Plaza and planter east of the Makerspace room is on Architectural drawings. I could not find it. | |
| 280. | Landscape | L2.2 | | | | | The civil drawings indicate a 10 x 35 concrete pad at the loading area, the landscape plan shows 4 squares in this area, clarify. | |
| 281. | Landscape / Architecture | L3.0 | | | | | Landscape drawings indicate that the site stair railings are on Architectural drawings. Where are these located? | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 282. | Structural & Architecture | S401 / A490 & A491 | | | | | Coordinate the top of walls on S401 and A490 & 491. | |
| 283. | Architecture | A490 | | | | | #7 Plan indicates 12" diameter footings, #3 section does not. What are these footings for? | |
| 284. | Structural | S-000 | Some additional design load information for the structure should be provided. Refer to IBC Section 1603.1 | A design load schedule is provided in the 60% CD drawings. | Noted. Still missing the snow drift surcharge loading and extent. This is usually indicated on the roof plans where the snow drifting applies. | A dedicated snow drift plan has been included: S002 | Closed. | |
| 285. | Structural | S-101A | Indicate slab on grade size and reinforcing. | Comment addressed in 60%CD drawings | OK. However, slab not indicated on drawing 1-101A. | This has since been corrected. | Closed. | |
| 286. | Structural | S-101A, S-101B, S-1011C, S101D | Indicate slab on grade sawcut control joint locations. | In exposed concrete areas joints are to be shown on architectural drawings. At non-exposed areas, the typical detail showing control joint layout can be used. | Closed. | | | |
| 287. | Structural | S-101A, S-101B, S-1011C, S101D | Column sizes should be shown. | Comment addressed in 60%CD drawings where there is a column schedule. | Ongoing. Columns schedule inClosed, base plate sizes, elev. and anchors not shown. | Drawings S202 and S203 now include base plate and anchor bolt designs | Closed. | |
| 288. | Structural | S-101A, S-101B, S-1011C, S101D | Pricing notes are vague and should be more specific for DD level. Typical wall and pier sections with reinforcing should be shown | Pricing notes have been removed and reinforcement is shown in section. | Ongoing. Limited foundation details provided in 60% set. | More details have since been provided. | Closed. | |
| 289. | Structural | S-101A, S-101B, S-1011C, S101D | MSBA requires footing elevations to be shown on the plan along each section and not just in a note. | Bottom of footing elevations will be shown in the next set of drawings. | Ongoing. Elevations not shown, | Bottom of footing elevations have since been provided. | Closed. | |
| 290. | Structural | S-101A, S-101B, S-1011C, S101D | Gridlines and dimensions should be shown. | A geometry layout plan will be generated to define the complex geometry of the grid system. | Closed. | | | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 291. | Structural | S-101A, S-101B, S-1011C, S101D | More info is required on the extent and depth of the Geo Piers under the footings and the slab-on-grade. | This information is described elsewhere as part of the ESP. | Closed. | | | |
| 292. | Structural | S-102A, S-102B, S102C, S102D | Typical grid and general framing dimensions should be shown at DD level submission. | Comment addressed in 60%CD drawings | Ongoing: There are no grid dimensions shown on any of the foundation or framing planes. | A dedicated grid dimension drawing has since been provided: S001 | Closed. | |
| 293. | Structural | S-102A, S-102B, S102C, S102D | Typical member sizes for beams and girders should be shown for DD Level submission, | Comment addressed in 60%CD drawings | Closed. | | | |
| 294. | Structural | S-102A, S-102B, S102C, S102D | What is the fire rating of the floor assembly? Are the framing members fireproofed? | Floor rating and steel members are rated 2HR, refer to code report. | Noted. There should however, be some reference to the code drawing on the structural drawings. Are all members fireproofed, or do some get other treatments such as Intumescent paint, etc. | A fireproofing diagram has been included in the set, see A002, added in PR 12. | Closed. | |
| 295. | Structural | S-102A, S-102B, S102C, S102D | Typical framing details should be shown at DD Level, Including typical exterior wall support details | Comment addressed in 60%CD drawings | Ongoing: Limited detailing has been provided in 60% set. Coordination with Arch. Details is required throughout. | Details have since been provided. | Closed. | |
| 296. | Structural | S-102A, S-102B, S102C, S102D | What is the Top of Steel Elevation? | Comment addressed in 60%CD drawings | Closed. | | | |
| 297. | Structural | S-102A, S-102B, S102C, S102D | Will there be any expansion joints at this level? | No expansion joints at this level. | Closed. | | | |
| 298. | Structural | S-103A, S-103B, S103C, S103D | Typical grid and general framing dimensions should be shown at DD level submission. | Framing dimensions will be added and grid geometry will be defined. | Ongoing: There are no grid dimensions shown on any of the framing plans. | A dedicated grid dimension drawing has since been provided: S001 | Closed. | |
| 299. | Structural | S-103A, S-103B, S103C, S103D | Typical member sizes for beams and girders should be shown for DD Level submission, | Comment addressed in 60%CD drawings | Closed. | | | |
| 300. | Structural | S-103A, | Typical member sizes for beams and girders should | Comment addressed in 60%CD drawings | Closed. | | | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| | | S-103B, S103C, S103D | be shown for DD Level submission, | | | | | |
| 301. | Structural | S-103A, S-103B, S103C, S103D | What is the Top of Steel Elevation? | Comment addressed in 60%CD drawings | Closed. | | | |
| 302. | Structural | S-103A, S-103B, S103C, S103D | Will there be any expansion joints at this level? | No expansion joints at this level. | Closed. | | | |
| 303. | Structural | S-103A, S-103B, S103C, S103D | Typical braced frame member sizes should be shown. | Comment addressed in 60%CD drawings | Ongoing: Member sizes shown, but required connection forces and typical details not shown. (Per Mass. Code the connections require a 2E multiplier for seismic loading when using R=3. | Design forces have since been shown on the braced frame elevations for delegated connection design and have been doubled per code. | Closed: However, note that the only the seismic forces need to be doubled in any particular load combination, and not the whole combination load. Thus, some of your forces may be a bit on the high side. | |
| 304. | Structural | S-103D | Should the roof deck over the Gym be acoustical deck? | This has been updated. And the gym roof is now acoustical deck in 60% CD drawings | Closed. | | | |
| 305. | Structural | S-104-B, S104C | Typical braced frame member sizes should be shown. | Comment addressed in 60%CD drawings | Ongoing: Member sizes shown, but the required connection forces and typical details are not indicated. | Design forces have since been shown on the braced frame elevations for delegated connection design and have been doubled per code. | Closed. | |
| 306. | Structural | S-104B, S-104C | Typical grid and general framing dimensions should be shown at DD level submission. | Framing dimensions will be added and grid geometry will be defined. | Ongoing: There are no grid dimensions shown on any of the framing plans. | A dedicated grid dimension drawing has since been provided: S001 | Closed. | |
| 307. | Structural | S-104B, S-104C | Typical member sizes for beams and girders should be shown for DD Level submission, | Comment addressed in 60%CD drawings | Closed. | | | |
| 308. | Structural | S-104B, S-104C | Typical member sizes for beams and girders should be shown for DD Level submission, | Comment addressed in 60%CD drawings | Closed. | | | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 309. | Structural | S-104B, S-104C | What is the Top of Steel elevation at this level? | Comment addressed in 60%CD drawings | Closed. | | | |
| 310. | Structural | S-104B, S-104C | Will there be any expansion joints at this level? | No expansion joints at this level. | Closed. | | | |
| 311. | Structural | S-105B, S-105C | Typical Sections at roof screen and top of steel elevations should be shown. | Comment addressed in 60%CD drawings | Ongoing. | Details have since been provided | Closed. | |
| 312. | Structural | S-200, S-201 | Is there any special finish required on the exposed steel? | These clerestory trusses have since been eliminated from the project | Closed. | | | |
| 313. | Structural | S-300 | Detail 10: Diamond isolation joints should be avoided as the joints in diamonds will telegraph thru the floor finishes. | Project team will review detail and potentially change to pinwheel isolation joint detail. | Closed. | | | |
| 314. | Structural | S-300, S-301, S-302, S-303 | Typical concrete and steel details should be provided for the DD set. | Comment addressed in 60%CD drawings | Noted. Continued detailing should be Ongoing. For CD set. | Details have since been provided | Closed. | |
| 315. | Structural | S-000 | Include an allowance for partition loading in the floor Live Loads. | A design load schedule is provided in the 60% CD drawings. Classrooms include 15psf partition loads. | Closed. | | | |
| 316. | Structural | S-000 | Include Design Live Loads for atypical spaces.: Gym, Auditorium, Cafeteria, Media Center/Library, Lecture Halls, etc. | A design load schedule is provided in the 60% CD drawings. | Closed. | | | |
| 317. | Structural | S101A, S1001B. S101C, S101D | | | The grade beams between footings appear to be sitting on the footing. Is this the case, or should they stop outside the footing as both the grade beam and footing are indicated to be 12" below slab. | Grade beams geometry has since been updated but in general grade beams match bottoms of footings. | Closed. | |
| 318. | Structural | S101A, S1001B. S101C, S101D | | | Given the need for Preconsolidation/ Surcharge of the soils under the SOG, is a 5" | Yes, it is sufficient. | Closed. | |

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| | | | | | slab with nominal WWF sufficient for the anticipated settlements? | | | |
| 319. | Structural | S101A, S1001B. S101C, S101D | | | All top of interior footings are indicated to be 12" below slab. Some may need to be dropped at roof drain leaders and at underground piping runs. Coordinate top of interior and exterior footings with the Below-Slab Plumbing drawings, P-100A, B, C, and D. | This needs to be coordinated. | Ok. Ongoing. | |
| 320. | Structural | S101A | | | How are the lateral earth forces being resolved into the Floor 2 framing? Shouldn't this wall be designed as a cantilevered retaining wall and not a typical foundation wall. Review Sections 1-S300 and 3- S400. | The wall on grid M is designed as a basement wall with some of the earth forces going into the 2nd floor diaphragm | Please clarify. Has the wall been designed for at-rest loading from the soil? Also, how is the reaction at the top being resolved? Thru the braced frames? There is over 2000 lbs /ft reaction at the top of the wall. This leads to very large forces in the braces and very high lateral forces in the footing. How is that being handled? | |
| 321. | Structural | S101A, B, C, and D. | | | Are there any special floor Ff and Fl requirements for wood flooring or Floor tiles, etc. Review requirements with flooring specs. (typ.). | Concrete spec lists special requirements for wood floor & tile. | Closed. | |
| 322. | Structural | All framing plans. | | | Where are the edge of slab dimensions indicated? Not shown on EOS Architectural Plans or Structural Drawings. Will the edge of slab be on a radius | Edge of slab dimensions are shown on Architectural drawings. Edge of atrium is segmented. | Closed. | |

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| | | | | | or will it be segmented? | | | |
| 323. | Structural | S102A, S103A | | | Line S5.7. Check beams supporting posts. They appear to be undersized. See also item 40 below. At Floor 3 the HSS post should be tied back to the concrete deck and not just to underside of beam. | Beam sizes have since been updated and posts go to deck underside | We are still seeing W12x16's under the posts up. Impossible to get a good bolted connection for the post's base plate on a 4" beam flange. Please review. | |
| 324. | Structural | S502 | | | Review design of canopy roof, especially cantilevered members south of Line M at the connection to column Line M. | The canopy is in the process of being redesigned for a new architectural approach | Ongoing. | |
| 325. | Structural | S102B | | | Check design and deflections of W12x19 and W12x16 spandrel beam on Line R3.8 and just off Line R3. | There is no longer a W12x16 in this area. | We are still seeing the W12x16's. in some places. Check the W12x16 on Line R3 between N7 and N8. appears undersized. Also check the W12x16 supporting the W21x62 between N8 and N8.1, north on line R3. | |
| 326. | Structural | S102B | | | Check sizes of all HSS columns with HSS beams framing into them. Ex, Cols.B/ N7 and B/N8 where there is an HSS 5x5 column supporting a HSS 20x 8" girt. | Column sizes are not an issue. Connections will be reviewed. | On-Going: You should seriously consider increasing the width of the columns to match the horizontal girts. | |
| 327. | Structural | All framing plans. | | | There are many HSS beam to Column moment Connections. These need to be detailed in order to show how these connections are to be fabricated. And if any special stiffeners are required. | More connection design details have since been shown on drawings. | Closed. | |

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| 328. | Structural | S102C | | | Check design of girders supporting coped W21x111 beams between S1 and S3 lines. | The W16 and W18 girders have been checked. | Closed. | |
| 329. | Structural | All framing plans, | | | Check allowable spans for 3'x18ga composite deck accounting for skewed sections that may dictate single span vs multiple span layout. | This has been checked. | Closed. | |
| 330. | Structural | S103B | | | Check design of girders supporting coped W21x111 beams between S8 and S10 lines. | The W16 and W18 girders have been checked. | Closed. | |
| 331. | Structural | S103B | | | Review hanger details at Breakout Bridge and Space. May want to Beef up W12x16's at Hangers. See ASCE-7 for hanger connection multiplier requirements. | Beam sizes have since been increased at the high roof. Hanger connection details are being finalized. | Closed. | |
| 332. | Structural | S103B | | | Is any sway bracing required at the Breakout Bridge or Space? | The bridge has in-plan truss action from added angles to provide stability. | Closed. | |
| 333. | Structural | S104B, and S104C. | | | Coordinate proposed size and location of mechanical rooftop units. Frame out openings as required. | This has since been coordinated. | Closed. | |
| 334. | Structural | All framing plans all levels. | | | Coordination with MEP drawings for all floor penetrations, duct shafts and openings etc. is required. | This has since been coordinated. | Closed. | |
| 335. | Structural | S103D | | | Review stage rigging supports with theatrical drawings. Are there any lateral loads from the thrust and head blocks etc. | Rigging support steel has since been shown. Loads provided by theatre consultant have been incorporated. | Closed. | |
| 336. | Structural | S102A | | | How are the wall fins attached to the building on Line M, and other similar areas. | Ongoing | Ongoing. | |

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| 337. | Structural | S102A. S102B and S102C | | | Has the weight of the Brick and snow drifting been account for on the low roofs? | Yes, these loads have been accounted for. | Closed. | |
| 338. | Structural | S103D | | | The masonry bearing wall on the west side of the gym is not continuous to roof. Please review. See A213. | It should be. This has been corrected. | Closed. | |
| 339. | Structural | All framing plans | | | Coordinate all loose and hung lintel requirements with Architectural drawings. | Structural exterior elevations showing loose lintel extent has since been included | Closed. | |
| 340. | Structural | S103D | | | Roof joists over the gym where required should be designated as ( SP) or special loaded joists. Mechanical unit weights with snow drifting, wind and seismic loading as well as gym equipment loads need to be identified in order to properly design the joist. | A dedicated drawing S003 – STEEL JOIST LOAD DIAGRAMS has since been included which contains all the necessary information. All joists on the projects are SP joists. | Closed. | |
| 341. | Structural | S-000 | | | | | Please review future PV loading noted as 10psf. The loads are dependent on the angle of the PV panels. The localized loading needs to be taken into account where the ballast loads locally are several hundreds of pounds, which can overload the decking. Recommend a minimum of 20 psf for ballast PV's and racking system. | |
| 342. | Structural | | | | | | With a structure this complex it would be beneficial to | |

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| | | | | | | | review all members in plan one more time to make sure that nothing has been mislabeled. | |
| 343. | Structural | S-503 Details 2,3,4,5 and 6. | | | | | Check the joist seats depths as drawn. Typical DLH joists have a 7.5" seat not 6.5" or 5". | |
| 344. | Structural | S-502, Canopy Section 5. | | | | | Is it possible to align all of the cantilevered WT beams with the columns. This would lead to a cleaner stronger frame. | |
| 345. | Structural | S-502 Entrance Canopy Framing plan. | | | | | Review connection for adequacy at HSS14x10 to Column at M/S5.7 | |
| 346. | Structural | S-502 Entrance Canopy Framing Plan. | | | | | Check deflection of 32' +/- Cantilever | |
| 347. | Fire Protection | General | Are intermediate fire department connections required? | Will review with AHJ. Standpipe connections are currently 360' +/- apart. Intermediate standpipe may be requested. | Open | Added a FDV for the middle open stairs in the atrium. | Item still open – has it been verified with Fire dept no additional roof manifolds are required? | |
| 348. | Fire Protection | FP1.01 | Coordinate exact scope of Division 21 work with Civil. Exact scope of work is missing. Suggest site utility dwg as part of FP set, including details. | Agree. FP will reference site utility spec. Fire service from water main into building will be installed by Division 21. | Open. Suggest this scope be located on the FP drawings and not just reference to Civil documents to avoid public bid issues. | Will include Civil site utility drawings as part of the FP Scope | Open | |
| 349. | Fire Protection | General – floor plans | Typical room sprinkler layouts missing | Will provide sprinkler head layouts. | Open. MSBA requires sizes and branch piping as well at this submission. | Branch Piping and sizes will be shown in the 90% MSBA Submission | Closed. | |
| 350. | Fire Protection | General – floor plans | Verify height of floor control assemblies is in accord with Fire Dept requirements. Height may not be allowed over 7 ft. | Will review with AHJ | Open | Will review with AHJ | Open | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 351. | Fire Protection | FP1.03 | Fire Dept Valves may not be allowed to be installed in dressing rooms behind stage; especially if rooms are lockable. | Fire department valves would be accessed from the corridor, not located in dressing rooms. Will coordinate with AHJ on preferred location of valve cabinets. | Open | Will review with AHJ | Closed. | |
| 352. | Fire Protection | General - roof | Are roof manifolds required or desired by Fire Dept? | Roof manifolds are required. Will review with AHJ on preferred location. | Open | Will review with AHJ | Open | |
| 353. | Fire Protection | FP101A | | | Loading dock area (outside) will require dry sprinkler protection/dry sidewall protection. | Will review with AHJ. Sprinklers are not required for non-combustible canopies with no storage below. | Open | |
| 354. | Fire Protection | FP101A | | | Exterior fire protection to include fire mains, hydrants, tapping sleeves, curb stops, etc. No documentation seen. | Civil site utilities drawing will be included as part of the FP Drawings | Open | |
| 355. | Fire Protection | FP101A | | | Why is water tight sleeve provided for fire main through foundation wall? | Will be removed | Open | |
| 356. | Fire Protection | General | | | Sprinkler system branches missing. Sprinkler protection missing from scattered areas/rooms throughout. Sprinklers missing below stairs. | All areas will be sprinkler protected. Branch pipes will be shown in the 90% MSBA Submission | Closed. | |
| 357. | Fire Protection | FP101A | | | Sprinklers missing in areas such as Breakout room 1054 and low ceiling space at left of it. | All areas will be sprinkler protected. | Closed. | |
| 358. | Fire Protection | FP102A | | | Is only one Storz FDC required or additional locations required by local Fire Dept? | Will review size and location with AHJ | Open | |
| 359. | Fire Protection | General | | | | | Suggest including RCP in background for coordination. Also, room names | |

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| | | | | | | | and soffits missing from background at times. | |
| 360. | Fire Protection | FP001 | | | | | Water service entrance detail shows grade beam. No grade beams seen | |
| 361. | Fire Protection | FP001 | | | | | Double check backflow preventer diagram shows incorrect elevation for assembly. Required to be 48" max to top of device per Mass. DEP, not 53". | |
| 362. | Fire Protection | FP001 | | | | | Flow test data is now out of date. (6 months max) | |
| 363. | Fire Protection | General | | | | | Verify wet sprinklers are desired in emergency electric rooms as indicated. If 1 hr enclosure provided, they aren't required except if mandated by local AHJ | |
| 364. | Fire Protection | General | | | | | Many floor plans show sprinkler heads but no piping to them (example, dwg FP101A, shop #1134) | |
| 365. | Fire Protection | FP101B | | | | | Sprinkler protection missing from Breakout room which is also not labelled. | |
| 366. | Fire Protection | FP101C | | | | | Verify heat is provided in plenum above entry vestibule 1045 to avoid Winter sprinkler pipe freezing | |
| 367. | Fire Protection | FP102B | | | | | Dry sprinkler heads – piping missing | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 368. | Fire Protection | FP102C | | | | | 3 sprinkler heads adjacent to each other in/at classroom walls – suggest a section be developed for clarity. | |
| 369. | Fire Protection | FP104B | | | | | Inadequate sprinkler protection in stair | |
| 370. | Fire Protection | FP104C | | | | | Suggest section to clarify where sprinkler is located and how piping is routed | |
| 371. | Plumbing | P0.01 | Water heater and pump schedules missing | Schedules are not provided on drawings. Equipment will be indicated in specifications. | Closed | | Closed. | |
| 372. | Plumbing | P0.01 | Backflow preventer detail – dimension to floor is to be from bottom of device to floor per Code. | Agree | Open | Backflow preventor mounting height requirement is addressed under specification. | Closed. | |
| 373. | Plumbing | P0.02 | Detail 1 – Is redundancy required for water heater? | Will review with Owner | Open | Yes. Two water heaters are shown. | Closed. | |
| 374. | Plumbing | P0.02 | Detail 1 – Valve and pump not allowed between heater and expansion tank. Also, check valve upstream of heater on CW supply not allowed without inspector permission. Mixing valve should be installed below top of heater. | Detail to be corrected. | Open | Per 248 CMP 10.14 (2) item 2. Thermal check valve with 1/8th hole in flapper and expansion tank is permitted. | Closed. | |
| 375. | Plumbing | P0.02 | Detail 3 – No valve allowed between heater and expansion tank. Also, check valve upstream of heater on CW supply not allowed without inspector permission. Swing check valve installed in vertical position may not function. | Detail will be corrected. | Open | Detail sheet revised. Per 248 CMP 10.14 (2) item 2. Thermal check valve with 1/8th hole in flapper and expansion tank is permitted. | Open. Shut-off valves between expansion tank and heaters are still present. | |
| 376. | Plumbing | P0.02 | Detail 4 – Verify chip tank is sufficient for chemicals used. pH adjustment system required? Depth of | Will review once chemical list is provided. | Open | Acid waste layout is revised with above ground tank. The | Open. Review new MSBA direction on acid neutralization. The direction is to | |

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| | | | vault structure may not be deep enough. | | | tank will be sized per Table 10.13 (7) | eliminate these systems, but must be coordinated with faculty | |
| 377. | Plumbing | General – below slab plans | Verify no footings bearing on piping below slab. Also, wall footings to be dropped at pipe exits and entrances to building. | Will coordinate with structural engineer. | Open | Coordination is ongoing. | Open | |
| 378. | Plumbing | General – sanitary venting | Some venting indicated appears to not meet Code. | Please specify location. | Water service room, for instance. Open | All vents will be shown. | Open | |
| 379. | Plumbing | General – Plumbing chases | Plumbing chases should be verified for adequate depth to accommodate fixture carriers/piping. Some look shallow. | Will be coordinated with Architect. | Open | Coordination is ongoing. | Open | |
| 380. | Plumbing | General – structural/ architectural/ plumbing coordination | There appear to be many instances of plumbing chases and walls with plumbing risers being located directly over beams. Requires coordination. | Will coordinate with Architect. | Open | Coordination is ongoing | Open | |
| 381. | Plumbing | General | Recommend hot water be recirculated directly behind all lavatories to ensure timely hot water with low flow faucets. | Will review. | Open | Will be shown near lavatories. | Open | |
| 382. | Plumbing | General | No natural gas indicated on plans | Natural gas will be shown for boiler, water heater, kitchen science classrooms on first level, and generator | Open | Will be shown on 90%CD | Open. Not complete | |
| 383. | Plumbing | General | Exterior wall hydrants missing throughout | Will provide | Open | Will be shown on 90%CD | Open. Not complete | |
| 384. | Plumbing | P2.01 | Emergency shower/eyewash required in boiler room at water treatment – corrosives used | Will be provided in mech room. | Open | Will be shown on 90%CD | Open | |
| 385. | Plumbing | P2.02 | Hot water expansion loops missing | Expansion fittings are required by specifications. Will review drawings for required locations. | Open | Will be shown on 90%CD | Closed | |

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| 386. | Plumbing | P2.02 | Suggest hot water recirc. loop with small elec heater for non-potable hot water system to Science classroom sinks. | Agree. | Open | Will be electrical heat trace for temperature maintenance | Closed | |
| 387. | Plumbing | General – Science rooms | No emergency shower-Eyewash stations seen in Science Classrooms. | Emergency fixture will be provided in Science rooms. | Closed | | | |
| 388. | Plumbing | P2.03 | Toilet/Shower room 1310 - Recommend floor drain outside shower. | Agree. Will provide | Closed | | | |
| 389. | Plumbing | General | Roof drainage seems to be missing from most of the set. Is secondary roof drainage required? | Primary roof drains now shown. Secondary system not required. | Closed | | | |
| 390. | Plumbing | P3.03 | Floor drain required for water heater and backflow preventer. | Agree. Will add. | Closed | | | |
| 391. | Plumbing | P3.03 & P3.04 | Emergency showers/eyewashes missing in Science classrooms | Emergency fixture will be provided in Science rooms | Closed | | | |
| 392. | Plumbing | General – Acid waste/vent | | | Polypropylene piping is not plenum rated. Need to specify PVDF or plenum rated wrap for piping in return air plenums | Noted. Acid waste / vent will not be running inside the air plenum. | Open. This assumes there is no horizontal acid waste or vent piping, although it is shown on plans. | |
| 393. | Plumbing | P001 | | | RP-1 indicated on water heater diagram is not piped | RP-1 is a prepackaged with Tempering valve assembly. See detail 6 on Dwg P004 for pipe connection | Open. How is RP-1 piped; where connected? | |
| 394. | Plumbing | P002 | | | Detail 7 – water meter to be specified & sized, state pressure settings on PRV's. Pipe sizes missing. | Pressure and size has been addressed on detail 7 | Closed | |
| 395. | Plumbing | P002 | | | Detail 11 – Verify if this a seismic category B or C building. If B, no seismic bracing required. | Seismic bracing is not required. | Closed | |
| 396. | Plumbing | P002 | | | Detail 14 – Sizes missing. | Gas pipe to building has been shown on the plan | Closed | |
| 397. | Plumbing | P003 | | | Detail 2 – Verify clearance for plaster | Will coordinate | Item open | |

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| | | | | | trap cartridge for maintenance | | | |
| 398. | Plumbing | P003 | | | Detail 8 – If this is for storm drainage tie-in, suggest a backwater valve be added. | Trap with float backwater valve has been specified. | Backwater float valve may "spit" (during rain deluge) | |
| 399. | Plumbing | P004 | | | Detail 1 – Specify frame/cover and "box" if any, for grease trap. | The grease trap is floor recessed type. | Closed | |
| 400. | Plumbing | P004 | | | Detail 5 – locate CO detectors on plans. | Has been shown on the plan | Item open – not seen | |
| 401. | Plumbing | P004 | | | Detail 1 – verify whether heat is required in vault. | The detail is for the interior grease interceptor. | Closed | |
| 402. | Plumbing | P004 | | | Detail 2 – Locate mixing valves on plans/ coordination with architecture. | The detail 2 is for the lab sink faucet pipe connection. The casework will be coordinated with architect. | Closed | |
| 403. | Plumbing | P005 | | | Detail 4 – Dual check valve/VB shown. Verify reduced pressure backflow preventer is provided. Only a dual check valve/VB does not meet Code. | The lab cold water is protected through reduced pressure backflow preventer. | Closed | |
| 404. | Plumbing | P001 | | | | | Shock absorber schedule – Verify pressure doesn't exceed 60 psi; if it does, shock absorbers need to be over-sized | |
| 405. | Plumbing | General – acid neutralization | | | | | Review new MSBA direction on acid neutralization. The direction is to eliminate these systems, but must be coordinated with faculty | |
| 406. | Plumbing | P001 | | | | | Expansion tank schedule – size looks very small for the water heater inputs. | |

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| 407. | Plumbing | P001 | | | | | Water heater diagram – Sub meter (SM-1) should be on the clod water feed to the water heaters. The arrangement shown will register every time the circulating pumps are on as well as when hot water being used… Not an accurate reading. | |
| 408. | Plumbing | P002 | | | | | Detail 3 – Insulation shield not sized, based on pipe size, etc. | |
| 409. | Plumbing | P002 | | | | | Detail 5 – which sinks require mixing valves? | |
| 410. | Plumbing | P003 | | | | | Detail 1 – where is access panel owned? (typical throughout – all systems) | |
| 411. | Plumbing | P005 | | | | | Recessed emergency shower/eyewash detail – verify a piped waste connection is not desired by school for testing. Suggest providing a emergency shower testing unit | |
| 412. | Plumbing | General – Below slab plans | | | | | Not complete – sizes/notes/crossing pipe inverts missing | |
| 413. | Plumbing | P100B | | | | | 8” RL shown in the building but 10” outside. 10” is correct unless sloped at ¼” per ft | |

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| 414. | Plumbing | General – belos slab plans | | | | | Floor cleanouts missing per Code. ((every 50' or 100' based on size) Architect will want these located for coordination | |
| 415. | Plumbing | P101A, P200, P201 | | | | | Kitchen plans are not complete – lacking information and clarity. | |
| 416. | Plumbing | General; plans | | | | | Pipe sizes missing at times, valves missing, vent piping missing, pipe notes missing, | |
| 417. | Plumbing | P101A | | | | | Verify adequate clearance between gas meter and building opening (door) | |
| 418. | Plumbing | General – plumbing chases | | | | | Verify adequate chase dimensions throughout – Many look too shallow; especially behind water closets, such as on dwgs P101B, P101C (near Fab Lab), P102B, P102C, etc. Also, there appear to be conflicts with cross-bracing and beams below "wet' walls and chases. | |
| 419. | Plumbing | P102B | | | | | Horizontal AW piping in plenum ceilings not allowed to be Polypropylene unless fire/plenum wrap used. (typical throughout) | |
| 420. | Plumbing | General – trap primers | | | | | Trap primers generally not indicated on plans. Suggest locating and specifying | |

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| | | | | | | | which type is to be used and where. | |
| 421. | Plumbing | General – Electric water coolers | | | | | Verify adequate clearance behind all units for recessed chillers or specify only non-recessed type (could be a problem for situations such as on P102C, at Toilet 2152 | |
| 422. | Plumbing | General | | | | | Plans at times appear to be incomplete and not cohesive with missing information, such as on P102C – where are P-10 emergency showers fed from? | |
| 423. | Plumbing | P104 | | | | | Verify all VTR's are no closer than 25' to fresh air intakes | |
| 424. | Plumbing | P200 | | | | | FS-1 at walk-in cooler/freezer for condensate drainage. Verify 300 gal/day is not exceeded. Also, verify with local plumbing inspector this drain can run to exterior grease trap (typical comment for kitchen hand sinks also) | |
| 425. | Plumbing | P200 and 201 | | | | | Plans incomplete. Also, kitchen and Custodian toilets scope is missing | |
| 426. | Plumbing | P101A | | | | | Custodial area/receiving normally includes a clothes washer/dryer. None seen. Is this in scope? | |

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| 427. | Plumbing | P300 | | | | | Plans incomplete. Also, what is the oil/water separator for? Not seen on plans – it appears this might be acid waste? If this is a true oil separator, might need a DEP approved unit | |
| 428. | Plumbing | P400-402 | | | | | Riser diagrams – sizes missing | |
| 429. | HVAC | GENERAL | Add key plan to all drawings | Key plan has been added to the drawings. | Closed | | | |
| 430. | HVAC | M104 | Suggest heat to be added in the mechanical pump house | Agreed. A unit heater has been added to the pump house. | Closed | | | |
| 431. | HVAC | M104 | Consider double doors into the pump house | Agree, double doors can be provided in lieu of (2) single doors, plans updated. | Open | Double doors will be included on the 90% drawing submission. | Closed | |
| 432. | HVAC | M104 | Add floor drains to pump house | We will review with manufacturer and plumbing to provide floor drains in the pump house. | Open | Floor drains will be provided on the 90% drawing submission. | Not located on M104. There is no pump house detail to confirm. | |
| 433. | HVAC | M104 | What is the makeup air for SEF-1 through SEF-4. Where is it shown? | Make up air for the smoke exhaust system will be provided by the architect via mostly louvers and potential for south entrance doors. | Not clear on life safety plans LS101-LS103. Suggest an airflow riser indicating locations/ sizes. | We will coordinate with the architect to provide a more accurate diagram on the life safety plans. HVAC drawings will also indicate these make-up locations. | Closed | |
| 434. | HVAC | M103C M102B | Please indicate why two dampers are shown normally closed and one shown normally opened? | The motorized dampers are provided to isolate RTU-1 & 2 from RTU-3 & 4 in the ring duct system, but maintain redundancy. This has since been eliminated via VM. | Can you please explain redundancy of this? It is not identified in the OPR or HVAC system description. Closed. | If any of the four RTU's were to have a failure, the other three rooftop units would be able to supply conditioned air to the spaces that would normally be conditioned by the now out-of-service RTU. The dampers were provided to isolate the various RTU systems during | Closed | |

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| | | | | | | normal operation, and in the event of a system failure, the dampers could be opened to create a single duct system. As indicated in DD designer response, these dampers and ring ducts have been eliminated per VE. | | |
| 435. | HVAC | M305 | All motorized dampers shown on the rooftop unit airflow diagram are tagged normally opened. See note above. | Half of the motorized are indicated as normally open, and half are normally closed. Thru VM, these dampers have been eliminated, see item 145 response. | Can you please explain redundancy of this? It is not identified in the OPR or HVAC system description. Closed. | See item 297 response. | Closed | |
| 436. | HVAC | M305<br>M306 | Chilled water flow diagram needs to be shown with air cooled chillers (2) and pump house on the roof. Coordinate these two diagrams please. | Thru VM, the quantity of chillers has been reduced to 1. The flow diagrams will be updated to reflect this. | Closed. | | | |
| 437. | HVAC | Fire Protection Chapter 9 Smoke Control (909) | Provide document that shows the firefighters smoke control panel. | This will be indicated within the controls series drawings in future submissions. | Open. | This will be coordinated with Electrical/Fire alarm included in the 90% submission. | Open | |
| 438. | HVAC | Schematic Design HVAC Narrative Part O | The new BMS is indicated as proprietary by Advanced Energy Management Systems. Please confirm if correct. | BMS narrative and specification updated to be non-proprietary BACnet controls with Tridium JACE. | Closed. | | | |
| 439. | HVAC | Narrative / M101A | Narrative outlines Boiler Plant in the Pump House. Drawings show Boilers in Boiler Room 101B. | The narrative will be updated to reflect floor plans. | Not Closed. | The narrative has been updated to reflect the plans. | Closed | |

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| 440. | HVAC | GENERAL | Are fire smoke dampers required in the duct leaving the shafts? | Fire smoke dampers are required only where shafts that serve more than 2 stories are penetrated by ductwork. The only location so far that this applies to is the gang bathroom exhaust ducts. | Closed. | | | |
| 441. | HVAC | M104 | Is smoke or fire protection required in the Mechanical Penthouse? | Smoke protection is not required within the pump house. We will review for the fire protection requirements. | What are your findings on FP? | Sprinkler head will be shown in the pump penthouse | Not shown on FP104C | |
| 442. | HVAC | M104 | Provide makeup water piping to the Penthouse | Make up water to the penthouse will be provided under the plumbing scope of work. Refer to M306. | Did not locate on plumbing drawings. | We will coordinate with plumbing engineer to ensure that this is included. | Not shown on P103D and cold and hot water riser diagrams. | |
| 443. | HVAC | M104 | Review ventilation requirements for Pump House | We will further review with manufacturer. | Open | We will review and revise the ventilation requirements and include the necessary provisions on the 90% submission. | Status confirmation? | |
| 444. | HVAC | M104 | How is Pump House installed on Roof? Is it on dunnage like the chillers? | Pump house shall be mounted on roof curb. Drawings updated. | Please show a detail. | A detail of the pump house curb will be included on the 90% submission. | Open | |
| 445. | HVAC | M104 | Review internal and external powered convenience outlets for the Pump House. | We will review with electrical for convenience outlets and add for future drawing submission. | Open | Convenience outlets will be coordinated and included on the 90% submission. | Open | |
| 446. | HVAC | Fire Alarm Fire Protection | Include a fire alarm input/output matrix for the Smoke Control System. | This will be indicated within the controls series drawings in future submissions. | Closed. | | | |
| 447. | HVAC | GENERAL | What discipline or drawing/specification identifies all the requirements for the fire alarm smoke control panel? | Will review and advise. | Is there a fire protection narrative? | Division 260000 will be responsible for this scope of work. | Is there a fire protection narrative? | |
| 448. | HVAC | GENERAL | What discipline is covering the scope of the special inspector testing | We will review the special inspector testing requirements | What are your findings? | The independent Third-party review shall be provided by | Closed. | |

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| | | | consultant? Will this be in Division 1? Please refer to Section 909 Smoke Control. | to determine the correct discipline. | | the owner. IBC 909.2 | | |
| 449. | HVAC | E400 | | | Show makeup air on the fire alarm riser. | The make up air interface with fire alarm is shown on detail 5/E307 | Not complete. Detail 5 on sheet is kitchen emergency power off wiring diagram. | |
| 450. | HVAC | M404 | | | Show makeup air on controls for smoke evacuation. | This will be included for 90% submission | Confirmed on M408 | |
| 451. | HVAC | GENERAL | | | Are the two VFDs for the smoke fans being installed in 2-hr rooms? Which rooms? | We will review and indicate on future drawing submissions. | Not shown on E300 | |
| 452. | HVAC | GENERAL | | | Recommend UPS Power for all makeup air provisions, Reference 909.11.1 | ATC contractor to wire components subject to 909.11.2 to a UPS backed up panel on the legally required distribution system. | Closed. | |
| 453. | HVAC | GENERAL | | | Add to ATC notes on control drawings that the system must comply with UL864. | This will be included on the 90% submission. | Not seen in 230000 | |
| 454. | HVAC | GENERAL | | | Specify that all ducts part of the smoke system are leak tested to 1.5 times the max design pressure | This will be included in the 90% submission. | Not seen in 230000 | |
| 455. | HVAC | GENERAL | | | SEF-1, SEF-2, SEF-3 and SEF-4: Confirm 1.5 times number of belts shall be specified. Confirm minimum service factor of 1.15. | This will be included in the specifications in the 90% submission. | Open. | |
| 456. | HVAC | GENERAL | | | SEF: Provide fan installation details on HVAC Detail Sheets. None shown. | We will include this on the 90% submission. | Open. | |
| 457. | HVAC | GENERAL | | | RTU=112 has an install issue with a 6" RO on P104C. | We will review and coordinate with plumbing for this conflict. | Open. | |
| 458. | HVAC | GENERAL | | | Show EPO (Emergency Power Off) switch on | This will be shown on the electrical | Not complete on E300 | |

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| | | | | | M201A Boiler Room Plan. | drawings for the 90% submission. | | |
| 459. | HVAC | M201A | | | Do not recommend running hot water pipes over VFD devices. Please review. | We will revise the pipe routing to avoid the VFD's. | Complete. | |
| 460. | HVAC | Piping Plans | | | Indicate anchors and guides on the thermal expansion HW loops | We will provide expansion loops with anchors and guides as required on the 90% submission. | Open. | |
| 461. | HVAC | RTU Unit Penthouses | | | Are there piping vestibules in the RTU penthouses? | Piping will be located up through service vestibule for connection to AHU HW/CHW coils separate piping vestibule not required. | Open. Not clear. | |
| 462. | HVAC | HVAC Details | | | Recommend a RTU penthouse detail to indicate devices, sensor, clearances. | We will provide a detail on the 90% submission. | Open. Not clear. | |
| 463. | HVAC | M202D | | | Pipe runouts to units are not labeled. Not clear where the HWS&R piping is routed on this plan leaving the Auditorium. | Pipe runouts have been revised. Additional noting has been added to clarify the routing. | Closed | |
| 464. | HVAC | M403/M201A | | | Show the low flow bypass valve location on the piping plans. Size the valve and pipe. | Bypass valve location and size will be indicated on piping plans in 100% CD documents | Open. | |
| 465. | HVAC | M201A | | | Piping not sized. Only in Boiler Room. | Pipe sizes have been added to the drawings. | Closed | |
| 466. | HVAC | M201B | | | Have you considered exhausting the electric rooms rather than provide ductless splits? Review Room 1127. | We found that ductless split systems are more suitable for the project as space for duct chases is limited and significant ductwork runs would be required. | Understood. Closed. | |

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| 467. | HVAC | M101C | | | Electric Room 1165: What is design approach? | Electric room 1165 at this time does not indicate a required cooling or heating load, and per code, does not require ventilation. We will review the equipment within the space in future submissions to determine is a ductless split system is required. | Understood. Closed | |
| 468. | HVAC | Details | | | Need/recommend cooling and heating coil hookup details. Identify popping connections, gauges, and hydronic specialties to the one or two high coils for each RTU. | We will include these details on future drawing submissions. | Closed | |
| 469. | HVAC | M104 | | | Suggest a piping vestibule for RTU-7. | Full service vestibule will be provided. | Did not locate on plans, schedule or specifications. | |
| 470. | HVAC | M104 | | | Suggest a piping vestibule for MAU-1. | Will be specified on 90% CD documents. | Did not locate on plans, schedule or specifications. | |
| 471. | HVAC | M102C | | | Electric Room 2167: What is design approach? | Electric room 2167 at this time does not indicate a required cooling or heating load, and per code, does not require ventilation. We will review the equipment within the space in future submissions to determine is a ductless split system is required. | Understood. Closed | |
| 472. | HVAC | | | | | | SMMA did not locate a division 23 specification as it relates to the pump house. | |
| 473. | HVAC | | | | | | Review if a motorized damper is required to be | |

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| | | | | | | | installed at the inlet of each SEF fan. It may need to be installed in the ductwork on the roof, or bought with the fan? | |
| 474. | HVAC | | | | | | Detail and call out the size of the sheet metal plenum ( if required) behind each make-up air louver. | |
| 475. | HVAC | | | | | | Draw the 8" HWS pipe to scale in the mechanical room. | |
| 476. | HVAC ELECTRICAL | M301 E303 | | | | | There is not scheduled equipment on generator power. | |
| 477. | HVAC | GENERAL | | | | | There is no HVAC Legend with the current drawing set. | |
| 478. | HVAC | M407 P004 | | | | | Coordinate with kitchen master gas valve control diagram for BMS status and control of a CO event (alarm, exhaust fan and MAU SOO) | |
| 479. | HVAC | M407 P003 | | | | | Recommend ATC status (ALM) on the elevator sump pump system. | |
| 480. | HVAC | M407 P001 | | | | | Recommend ATC temperature on the hot water storage tank. | |
| 481. | HVAC | M407 M408 | | | | | Coordinate the two plans and show the makeup air motorized damper locations on the floor plans. | |
| 482. | HVAC | M407 | | | | | Fix notes as they correspond to the unit numbers. For example, leak | |

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| | | | | | | | detection and note #3. | |
| 483. | HVAC | GENERAL | | | | | There are no fire/smoke dampers shown on the supply air risers. | |
| 484. | HVAC | RTU-1/2<br>RTU-3/4 | | | | | Based on the plans is there a concern in regards to the unit clearances with all the SEF weather hoods and fan roof curbs? | |
| 485. | HVAC | M104 | | | | | Not clear to SMMA the outside air (intake) and exhaust air section of all the units. | |
| 486. | HVAC | M104<br>M305<br>RTU UNITS | | | | | With a 36" roof curb; How do you get into these units? Has a stair/platform been designed with structural? | |
| 487. | HVAC | | | | | | Review if there is enough makeup air in the adjacent corridor to the trash room when EF-3 is running. | |
| 488. | HVAC | M408<br>A104<br>A543 | | | | | Exhaust air coordination at top of wall is unclear for the SEF fan ducts penetrating the building structure. | |
| 489. | HVAC | M104<br>A104 | | | | | SEF-2 and DCU-7 appear to be in conflict roof access door. | |
| 490. | HVAC | M104<br>A104 | | | | | HVAC roof equipment plan and arch roof plan are not fully coordinated. Condensing units and kitchen freezer | |

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| | | | | | | | units need to be shown. | |
| 491. | HVAC | M104 | | | | | KEF-1 fan and pump house maintenance doors should be coordinated. Appears to be a conflict. | |
| 492. | HVAC STRUCTURAL | | | | | | How is the pump house being installed on the roof? There is no dunnage detail for the pump house. | |
| 493. | HVAC | | | | | | Chiller curb/dunnage. How high off the roof is the pump house? You will need steps to get in and out. | |
| 494. | HVAC | | | | | | Add blind flanges and isolation valves to come with each pump house's pipe outlets. Quantity of four (4). | |
| 495. | HVAC | M104 | | | | | Suggest ventilation or a Dx Cooling Unit for the pump house. | |
| 496. | HVAC | E204 E301 | | | | | Who is installing the two (2) electrical panels. Not shown on electrical plans. | |
| 497. | HVAC | M401 | | | | | An additional MERV 14 filters may need to be installed. Show it/them and own additional DP switches. | |
| 498. | HVAC | M401 | | | | | Who controls the speed of the energy wheel? | |
| 499. | HVAC | M401 | | | | | Show/clarify ATC devices and sensor and unit provided devices and sensors. | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 500. | HVAC | M401 | | | | | Add high limit switches add if there is an event, disable unit, open the HW valve 100% and alarm the BMS manual reset. | |
| 501. | HVAC | M401 | | | | | Coordinate with Owner recommendation of a manual reset freeze protection device. | |
| 502. | HVAC | M401<br>M301 | | | | | Schedule a low limit minimum OA CFM for the demand control units with CO2. | |
| 503. | Electrical | C-2.1, E-PH-1 | Locations of the site lights don't match electrical site plan. Coordinate | Civil notes state to see MEP plans for locations. | Dwg. E-PH-1 is not included in the package. Review can't be done. | The work on E-PH-1 is currently under construction and will not be part of the bid documents. | Current notes for site light locations:<br>-Dwg L1.2 "Parking lot lights, see Electrical drawings".<br>-Dwg C-2.1 Note 2 "Refer to MEP plans for locations"<br>- Dwg E-PH-1 Note 2 "Refer to Landscape drawings for location of site fixtures".<br>Please assign a discipline who will be in charge of locations.<br>Recommendation to add a note on Dwg E-PH-1 stating "Scope of work shown on this drawing is NIC. Drawing is provided for reference and coordination purposes." | |
| 504. | Electrical | C-2.3, E003-1 | Electrical manhole is not shown on the civil plan. Location of the power, | Locations of power, communication and FA services are | No coordination has been done. Also, show location of the | Has been added. | Closed | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| | | | communication and FA services are not coordinated. | shown and coordinated. | generator and an emergency power duct bank on the civil plan. | | | |
| 505. | Electrical | C-2.1, E003-1 | Location of the electric car charging stations is not shown on the civil plan. | This item is still being discussed with owner. | Open | There are no electric car charging stations on project, will be removed from the project. | Drawings C-4.1 and E003-1 show (3) symbols noted “EV charging stations”. Please clarify scope of work (Power? Communications? Provisions for “future”? Or will be deleted from drawings entirely?) | |
| 506. | Electrical | C-2.1, E003-1 | Locations of the site lights, security camera poles are not shown on the civil plan. | Civil notes state to see MEP plans for locations. | Electrical plans are diagrammatic. Note 10 on the civil plan doesn’t allow to coordinate location of the all utilities | Detail references and electrical items have been added to drawings | Coordinate security pole locations, please see comment for Item 1 above. | |
| 507. | Electrical | C-2.1, E003-1 | Generator set location is not shown on the civil plan. Coordinate. Show natural gas line to the generator. | Generator continues to be coordinated. | No coordination has been done yet. | Has been coordinated | Closed | |
| 508. | Electrical | C-4.2, E003-2 | Show location of the site lights, refer to electrical plan. | Civil notes state to see MEP plans for locations. | Electrical plans are diagrammatic. Note 10 on the civil plan doesn’t allow to coordinate location of the all utilities | Detail references and electrical items have been added to drawings | Current notes for site light locations: -Dwg L1.3 “Bollard light, see Electrical drawings”. -Dwg C-4.0 Note 2 “Refer to MEP plans for locations” - Dwg E-003-2 Note 2 “Refer to Landscape drawings for location of site fixtures”. Please assign a discipline who will be in-charge of locations. | |
| 509. | Electrical | E003-1, P0.02/4, C2.1 | Wiring of the (2) acid neutralization tanks is not shown on the electrical plan | This will be picked up on next submission. | Not included. Plumbing details have been moved to P005 | Updated plumbing drawings received the wiring for the tanks will be coordinated and shown for the 90% CDs | Closed | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 510. | Electrical | C-7.4 | Add a base detail for a site lighting pole. Coordinate with detail on dwg. E004 | Detail will be shown on electrical sheet. | Not coordinated. Details on dwg.E004 indicate the bases be provided by site contractor. | This is correct and work is ongoing on site. | Detail E004/3 states that concrete base is by Site Contractor. Civil drawings don't show the acceptance of this scope. Please clarify. | |
| 511. | Electrical | A001 | No info shown on the dwg. | Will continue to develop | Symbols drawing is not in the package | Unclear what this is referring to. There should only be architectural items on A001, not electrical | Closed | |
| 512. | Electrical | A101, A102 | Location of a toilet room (at principle office) above main electrical room is not recommended | Appropriate protection is required by architect where plumbing is installed over electrical panels. | Plumbing shaft with hot and cold water and sewer piping above main electrical room is not recommended. | Will provide proper protection | Please note that the "proper protection" method (such as dripping pan) will require a formal approval by Electrical Inspector. | |
| 513. | Electrical | E300, E301 | Confirm the transformers (located remote from the primary side panels) will be with the primary side disconnect switches or lockable devices will be used per MEC 450.14 | All remote transformers will conform to NEC 450.14 | Closed | | Closed | |
| 514. | Electrical | E301, E302 | Panel PP2B is power fed from panel MP1B. Panel MP1B shall be 400A bus/250A main breaker. | This will be revised | PP2B is fed from new panel 2DP1B. Revise panel schedule 2DP1A and add schedule for 2DP1B per one-line diagram E-301 | This will be completed for the 90%CD set | Closed | |
| 515. | Electrical | E301, E302 | Panel MP1B shall be 400A bus/250A main breaker. Is it single or double tub panel? | This will be revised. | Revised diagram for panel MP1B is acceptable. | Ok | Closed | |
| 516. | Electrical | 260000.2.23A , E301 | Per spec- 200kW diesel generator set, but per dwg.- 250kW natural gas generator set. | A calculation was Closedd since the previous set and the generator will be 300KW and edited so that drawings match the specifications. | Closed | | New comments: Correct below to match the design intent:<br>- 260010.1.3.B.4 – "..diesel..."<br>- 260010.2.23 - "300KW …gas"<br>- Dwg E003-1 "250KW generator with 10ft stack", | |

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| | | | | | | | - Dwg E301- 350KW. Reconfirm stack height for upsized generator. | |
| 517. | Electrical | E301 | Is a generator set with a natural gas engine approved by local AHJ to support life safety loads? | A request has been issued to the AHJ. The facility directors have stated that existing emergency stand-by generators in the city are currently natural gas so the design team has followed that precedence. | Closed | | Closed | |
| 518. | Electrical | 260000.2.23K | Per spec- “load bank for indoor mounting adjacent to a generator in series with engine radiator”?? Clarify and revise type of housing if required. | There will be no load bank if the generator remains natural gas fired. | Closed | | Closed | |
| 519. | Electrical | 260000.2.23 M, E201A, E301 | Show a manual transfer switch location and wiring for connection of roll-up generator set | Will show on next submission. | Wiring for life safety loads transfer to temporary generator is not shown | Manual transfer switch is shown wiring not complete. This will be complete for the 90%CDs | Closed | |
| 520. | Electrical | E302 | Panel MP3C is fed from 75kVA transformer, it shall be 400A bus/250A main breaker | Will correct. | Closed | | Closed | |
| 521. | Electrical | E301, E302 | Is panel 2DP1C power fed from T-6 or T-7 size transformer? Coordinate a schedule and one-line diagram. | Will revise in next submission. | Closed | | Closed | |
| 522. | Electrical | E301, TL111 | TL dwg. requires 200A power feed to a dimmer rack and also an emergency power feed. Dwg. E301shall be revised accordingly. | Will add emergency power feed as required. | Closed | | Closed | |
| 523. | Electrical | 260000.2.14D | Main switchboard short circuit rating of 100kA is too high (add’l cost). Rating should not exceed 65kA. | Will reduce to 65KAIC | Closed | | Closed | |
| 524. | Electrical | 260000.2.14H and 2.17E, E301 | Coordinate location of the utility metering CTs and PTs between the spec pars, | Will coordinate with utility. | Spec and drawing are not coordinated. | Specification has been edited to cold sequence metering, | Closed | |

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| | | | revise a diagram accordingly. | | | CT's and PTS installed in the CT section of the switchboard. | | |
| 525. | Electrical | All plans | Add a key plan on each dwg. | Will do | Closed | | Closed | |
| 526. | Electrical | A102, E300 | Rm. 2254 is not emergency electrical closet. Change a room name. | Will coordinate with architect. | Not coordinated yet. | Will be revised. | Closed | |
| 527. | Electrical | FP1.01 | FP service piping is shown in the main electrical room, it should be relocated. | Will be coordinated. | Closed | | Closed | |
| 528. | Electrical | E401A | Show FP tamper and water flow switches in Rm.1023 | Will be coordinated as drawings develop. | Open Room has been re-numbered to 1022. | Updated FP plans have been issued this will be coordinated for the 90%CD's | Closed | |
| 529. | Electrical | E401B, FP1.02 | Show FP tamper and water flow switches, refer to FP plan | Will be coordinated as drawings develop. | Open | | Closed | |
| 530. | Electrical | E401C, FP1.03 | Show FP tamper and water flow switches, refer to FP plan | Will be coordinated as drawings develop. | Open The FP plan has been re-numbered to FP1.01C | Updated FP plans have been issued this will be coordinated for the 90%CD's | Closed | |
| 531. | Electrical | FP plans | Add building key plan on each dwg. | Will add. | Closed | | Closed | |
| 532. | Electrical | E401D | Quantity of the FA speaker/strobes in Gym is not sufficient for 15dB above ambient noise. Consider high output and overhead mounted devices. | Will be corrected. | Open | In process of being addressed. | Open | |
| 533. | Electrical | 260000 par.2.18Z | FA 1 watt output speakers are not sufficient for public areas such as Gym, atrium, etc. | Will be corrected. | Open | Speaker strobes are adjustable to 2 W high output will be provided in the gym | Closed | |
| 534. | Electrical | E402B E402C E403B E403C | Show FP tamper and water flow switches, refer to FP plans | Will be coordinated as drawings develop. | Open | In process of being completed. | Open | |
| 535. | Electrical | E202.A, FP2.01 | Show location of the FP electric bell on electrical plan | Will be coordinated as drawings develop. | Open. Coordinate location with FP102A | In process of being completed. | Open | |
| 536. | Electrical | P2.01 | Multiple piping runs in the main electrical room. Coordinate with electrical/ relocate | Will be coordinated as drawings develop. | Closed. | | Closed | |

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| 537. | Electrical | E201A, M101A, A101A | Pumps P-1 and P-2 are located in custodian toilet rm.1016. Coordinate. | Will be coordinated as drawings develop. | Closed | | Closed | |
| 538. | Electrical | E303, M301 | Circuit breakers for the all RTUs 1 to 8 are oversized. Refer to mechanical schedule. | Will be coordinated as drawings develop. | Closed | | Closed | |
| 539. | Electrical | E302, E303 | Equipment schedule indicates all RTUs are wired from main switchboard MSB. MSB schedule does not reflect the same. | The schedule will be corrected as the drawings develop. | Open. RTUs are wired from 4DPXX panels. | In process of being worked on schedules will be updated once wiring is complete. | Closed | |
| 540. | Electrical | E303, M301 | Circuit breakers for the both chillers are oversized, 600Amp vs. 400Amp in M301 schedule. | Will be coordinated as drawings develop. | Closed | | Closed | |
| 541. | Electrical | E302, E303 | Equipment schedule indicates two chillers are wired from main switchboard MSB. MSB schedule does not reflect the same. | Will be coordinated as drawings develop. | Open. Add 800Amp chiller breaker in MSB1A schedule. | Will correct. | Closed | |
| 542. | Electrical | E303, M301 | Pumps P1 to P4 are 25HP on electrical plans, but they are not sized yet in schedule on M301. Coordinate. | Will be coordinated as drawings develop. | No pumps size selection has been made by mechanical. Wiring to be completed. | Ongoing. | M301 schedule indicates P-1 & P-2 as 25HP. Closed. | |
| 543. | Electrical | E204ABCD | Change roof plan number to E204, to be consistent with all other disciplines | Ok will revise. | Closed | | Closed | |
| 544. | Electrical | E204, M104, A104 | Architectural roof plan does not match the engineering plans. Pump house is missing, the chillers location to be changed. | Will update model and coordinate mechanical equipment locations. | Pump house plan is missing on E204. | Ongoing. | Open | |
| 545. | Electrical | E303, M301 | There are (11) ductless cooling units in electrical schedule, and (7)- in mechanical schedule. No electrical data is shown in the mechanical schedule | Will be coordinated as drawings develop. | Quantity has been coordinated. Electrical data is still not shown in the mechanical schedule. Electrical schedule update is pending. | Ongoing. | Electrical data (MCA, MOCP) is still not shown in the mechanical schedule. Electrical schedule update is pending. | |
| 546. | Electrical | E303, M301 | Exhaust and supply fans data is missing in the mechanical schedule, but electrical schedule on E303 includes the fans HP, voltage and wiring. Quantity | Will be coordinated as drawings develop. | Electrical data is still not shown in the mechanical schedule. Electrical schedule update is pending. | Ongoing. | Open | |

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| | | | is also different. Coordinate. | | | | | |
| 547. | Electrical | 260000.2.24, E204, E205 | Drawings and spec show a different type of a lightning protection system. Coordinate | A lightning preventor system will be provided. Drawings will be edited to match | Details on E205 needs to be revised. | Will correct the details to preventor style. | Open | |
| 548. | Electrical | E302, 260000.2.14 and 2.15 | Note 1 for MSB and 4DP1B schedules allows the breakers be series rated. Spec does not state anything. Confirm design intent and coordinate. | Will be coordinated as drawings develop. | MSB note 1 and spec should be coordinated | Will coordinate. | Open | |
| 549. | Electrical | Electrical power plans, spec 12 24 14 | Spec for motorized shades is included. No wiring is shown on electrical plans. Coordinate. | Will be coordinated as drawings develop. | Open | Ongoing. | Open | |
| 550. | Electrical | E303, P0.01 | Plumbing equipment schedule is missing on P0.01, although it is shown on E303 with HP, voltage and wiring data. Coordinate. | Will be coordinated as drawings develop. | Open | Ongoing. | Dwg P001 has electrical data. Closed | |
| 551. | Electrical | E102B, A182B | Typical for all classrooms. Ceiling soffits on architectural and electrical plans are not matching. Verify length and installation of the LC3 fixtures | Will be coordinated as drawings develop. | Closed. | | Closed | |
| 552. | Electrical | E102B (typical for lighting plans) | Typical for all classrooms. Are (2) LC3 fixtures sufficient for classroom seating area illumination? Verify lighting calculations. | Lighting calcs will be Closedd to ensure IESS illumination levels are met. | Open. Include opposite walls vertical illumination levels. | Ongoing. | Open | |
| 553. | Electrical | E102D, GA005 | Is auditorium lighting layout coordinated with the performance lighting pipes? | Needs further coordination. | Coordinate location of stage PC1 lights with stage pipe 4 | Ongoing. | Open | |
| 554. | Electrical | A101D, GA001 | Theatrical electrical room 1347 size and layout are not matching on these plans | Will continue to coordinate. | Open. Room has been re-numbered 1348 on A101D | Will complete coordination for the 90%CD's | Open | |
| 555. | Electrical | E300/6, GA111/1 | Conflict in Room 1347 size and layout of the electrical and theatrical lighting control equipment | Will continue to coordinate. | Open. Room has been re-numbered 1348. | Will complete coordination for the 90%CD's | Open | |

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| 556. | Electrical | 260000.1.30, 230000.1.32 | Electrical spec requires VFDs for fans/pumps be furnished and installed by Div.23. Mechanical spec requires the same be done by Div.26. VFD spec is not included in either Div.23 or Div.26 specs. | Will coordinate responsibilities matrix. | Open. | Responsibility coordination matrix will be completed for the 90%CD's | Suggesting VFD's to be provided by Div.23, and installed/wired by Div.26. Open. | |
| 557. | Electrical | 260000.1.31 | Par. refers to spec 012300 for Gym Walking Track alternate 3. Section 012300 is missing. | This alternate is incorrect. Will coordinate alternates with architect. | Coordination is required. | Will revise | Closed | |
| 558. | Electrical | E-301 | | | Is transformer feeding panel 2DP1B K-rated? | yes | Closed | |
| 559. | Electrical | E-302 | | | Panels 2DP1A, 2DP1B and 2DP1C shall be with 200% neutral | yes | Closed | |
| 560. | Electrical | E-302 | | | Add panel 2DP1B (via a transformer) in the main switchboard schedule | Will add | Open | |
| 561. | Electrical | 260000.2.14D E302 | | | Change MSB short circuit rating in spec to 65kA to match the schedule | done | Closed | |
| 562. | Electrical | 260000.2.14 | | | Add an energy reduction maintenance switch (ARMS) for MSB main circuit breaker | done | Closed | |
| 563. | Electrical | 260000.2.14 | | | It is recommended the MSB feeder breakers 400Amp and larger be with electronic trip for coordination purpose | Done 250Amps or larger will be electronic trip. | Closed | |
| 564. | Electrical | M301; E303 | | | RTU1/2 and RTU3/4 schedule on M301 shall state that a separate power ckt is required for each of 4 units | Will be added. | Open | |
| 565. | Electrical | E204; M104 | | | Split system condensing units #s 2,3,4,6 and 7 are not shown on the electrical plan. Also, M104 shows a unit#8 that is not scheduled. Coordinate. | In process of being coordinated. | Open | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 566. | Electrical | E201D | | | Should the aisle lights be provided in the auditorium seating area? | No, overhead aisle lighting will be provided | Closed | |
| 567. | Electrical | E201D; GA111/1 | | | Coordinate quantity of the devices and circuits in auditorium/stage area | Will coordinate. | Open | |
| 568. | Electrical | E102D | | | Identify emergency lights in Gym and Auditorium | Will do | Open | |
| 569. | Electrical | E301; E300/1; E005/3 | | | Why MI cable is shown on E301 from ATS-LS to a generator? The feeder is installed underground in a duct bank. | MI is not required will edit | Closed | |
| 570. | Electrical | E301 | | | Utility metering CTs are in the switchboard and a meter is on the transformer enclosure. Distance between CTs and meter is a limiting factor. Coordinate w/utility metering department | Will coordinate with the utility and architect to show meter on the outside of the electric room. | Clarify status of review with Utility provider | |
| 571. | Electrical | E305; E200 power plans | | | Identify plug load controlled receptacles on the plans. There are no controlled receptacles shown in the office areas. | This will be added to meet energy code. | Add “controlled” receptacle symbol to Legend.<br>Per detail E305/1 only the top outlet in duplex receptacle is expected to be “controlled” – please clarify the intent. The current layout in typical admin office shows (2) duplex receptacles to be “controlled” (half in each duplex)– such approach may not meet the 50% minimum requirement. Please review/modify design. | |

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| 572. | Electrical | E301; E302 | | | Kitchen transformer – 45kVA, panel KPP1A – 400Amp. Revise. Provide panel schedule and load data. Kitchen panel should not be w/200% neutral. | Will be corrected. | Kitchen panel is wired to panel 2DP1A. There is no transformer. Closed. | |
| 573. | Electrical | E306 | | | Note 19. Provide GF breakers in panel KPP1A or show GFI type receptacles per the kitchen equipment schedule | Note 19 will be edited to say kitchen and not culinary arts. | Open | |
| 574. | Electrical | E003.1 | | | | | Site lighting: complete wiring/circuiting. | |
| 575. | Electrical | E003.1 | | | | | "WP" receptacles noted "P" – please clarify the "P" intent here. Per Legend, "P" denotes "pedestal-mounted on casework". Complete wiring/circuiting. | |
| 576. | Electrical | E003.1; E004 | | | | | Duct bank details have names "A-A", "B-B", etc. – not tagged on site plans yet. | |
| 577. | Electrical | E001 | | | | | Lighting control symbols "L", "Lk", "Lv" make a reference to the ALCS one-line diagram – suggest to add Dwg number where it can be found in set, E306. | |
| 578. | Electrical | E001; E306 | | | | | Lighting control stations in various combinations such as "on/off", "dimming", "multi-station dimming", etc. are not on Legend – suggesting to either add them to | |

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| | | | | | | | Legend or make a reference to drawing E306 with explanation/model for each type used in this project. Symbols that are not used in this project can be removed from One-Line. | |
| 579. | Electrical | E101A | | | | | Lighting control concept in the Head End and Main Electric differ from other spaces – a line voltage toggle switch vs. networked control station L - please clarify/correct. | |
| 580. | Electrical | E101A | | | | | Building-mounted lights: complete wiring/circuiting and controls concept. | |
| 581. | Electrical | E101A | | | | | Exit sign in Receiving – is it ceiling-mounted or wall-mounted above the door installation method? | |
| 582. | Electrical | E101A | | | | | Receiving/Workshop/Storage/Corridor area – if there are no occupancy sensors, what is the automatic control concept? | |
| 583. | Electrical | E101B; E101C; E101D; E102A; E102B; E102C; E102D; E103A; E103B; | | | | | Wiring/circuiting is in progress | |

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| | | E103C; E103D | | | | | | |
| 584. | Electrical | Lighting System: General Comment | | | | | Are there any interior time-controlled areas or all spaces are controlled by occupancy sensors only? Will there be any "NL" (Uncontrolled "Night Lights")? | |
| 585. | Electrical | Lighting System: General Comment | | | | | Lighting in typical corridors– please clarify controlling method – time-controlled? Occupancy sensors? Uncontrolled? If "time-controlled" – is there a manual override system for "emergency" lights during "unoccupied" time? Suggesting to provide manual override stations at the main/secondary entrance vestibules, to be used by police, FD or authorized people during afterhours/night. | |
| 586. | Electrical | General: Lighting in Typical Classrooms | | | | | Quantity of occupancy sensors - will the current amount provide a full "hand motion" coverage? | |
| 587. | Electrical | E101B | | | | | Toilet 1252: is there sufficient illumination level? | |
| 588. | Electrical | E101C | | | | | Lockers 1231,1234 – where switches "Lab" are located? | |

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| 589. | Electrical | E101C | | | | | Learning Common and adjacent corridors need "emergency" lighting. | |
| 590. | Electrical | E101D | | | | | Toilet/shower 1323 needs lighting control station | |
| 591. | Electrical | E101D | | | | | Offices 1213,1214 need lighting control stations | |
| 592. | Electrical | General: Occupancy sensors in student toilet rooms | | | | | Clarify type (technology) of occupancy sensors – ultrasonic? | |
| 593. | Electrical | E101D | | | | | Dressing rooms 1343,1347 – control switches shall be moved from behind the door. | |
| 594. | Electrical | E101D | | | | | Vestibules 1342,1346 need some type of controls. | |
| 595. | Electrical | E102A | | | | | Office Principal 2014 – clarify controls concept – switching? No manual dimming? Also, add occupancy and daylight sensors. | |
| 596. | Electrical | E102A | | | | | Conference room 2016 add control station (switching or dimming). | |
| 597. | Electrical | E102D | | | | | Gym 1320 needs "emergency" lighting and controls. | |
| 598. | Electrical | E102D | | | | | Auditorium 1340 needs "emergency" lighting at stage and adjacent area. Also, needs controls. | |

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| 599. | Electrical | E103B; E103C | | | | | Common area lights "SP1" – circuiting and controls are in progress. | |
| 600. | Electrical | E103C | | | | | Breakout 3058 needs controls. | |
| 601. | Electrical | E201A | | | | | Makerspace/shop 1134 – complete cord reals and welder wiring. Any power required above two tables in the middle? | |
| 602. | Electrical | E201A E201B; E201C; E201D; E202A; E202B; E202C; E202D; E203A; E203B; E203C; E203D | | | | | Wiring is mostly completed, except for a few rooms and spaces. Complete wiring/circuiting. | |
| 603. | Electrical | E202D | | | | | Stage equipment and "performance lighting" connector strips (assumed, no tag is present) - complete wiring. | |
| 604. | Electrical | E302 | | | | | A few 120/208v panels (PP1C, TEP1D, EP3C, etc.) are provided with shunt trip on MCB's – what is the purpose? What is the "tripping" concept (not shown on Power One-Line)? | |
| 605. | Electrical | E302 | | | | | 120/208v and 277/480v panel schedules – complete selection/quantity of circuit breakers. | |

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| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 606. | Electrical | E302 | | | | | Distribution panels 2DP1A, 4DP1B, 2DP1B, 4DP1C show 2-3 “spaces” – is this sufficient? | |
| 607. | Electrical | General: FA | | | | | Symbol speaker/strobe +”A” circle – add to Legend or provide clarifications. | |
| 608. | | | | | | | | |
| 609. | | | | | | | | |
| 610. | Security | E500 | TS not called out under security system. | This is an electrical component and shown on the electrical plans we will add this symbol to the security symbol list for clarity. | Closed | | | |
| 611. | Security | General | Missing key plan for all sheets. | Will add | Closed | | | |
| 612. | Security | 501A | Floating door contacts. | Will fix | Closed | | | |
| 613. | Security | E501A | IC not called out on E500. Is AI meant to be IC? | corrected | Closed | | | |
| 614. | Security | E501C | Door contact in wall in chair storage room 1164. | Will fix | Closed | | | |
| 615. | Security | E501D | Missing door hardware and card reader for AV room 1347. | Will add | Closed | | | |
| 616. | Security | E502A | Motion detector should be moved out of closet 2017 into conference-lg 2016. | Will fix | Closed | | | |
| 617. | Security | E502B | Missing motion detector, door hardware and card reader at stair 2005. | Will add | Closed | | | |
| 618. | Security | E502C | Missing card reader and door hardware at stair 2065. | Will add | Closed | | | |
| 619. | Security | E503B | Missing motion detector at stair-2 3005. | Will add | Closed | | | |
| 620. | Security | General | Door contacts at roof access hatches? | Will be provided | Closed | | | |
| 621. | Security | E501A | Missing card reader and door hardware for head end room 1026. | Will add | Closed | | | |

| Item | Discipline | DWG/Spec | Design Development | | 60% Construction Documents | | 90% Construction Documents | |
|---|---|---|---|---|---|---|---|---|
| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 622. | Technology | General | Wall phone outlets in classrooms are not on the wall. | Has been corrected | Closed | | | |
| 623. | Technology | General | Speakers in classrooms are not in center of room. | Speaker is located at 8'-0" ceiling before it angles up to exposed deck | Open | Will coordinate further. | | |
| 624. | Technology | General | Missing key plan for all sheets. | Will add | Closed | | | |
| 625. | Technology | General | Head End Room is the MDF? | Correct. | Open | yes | | |
| 626. | Technology | T101A | Missing annotation for tel/data outlet in main electric room 1024. | Will fix | Closed | | | |
| 627. | Technology | T101B | Consider adding second flush mounted ceiling speaker in media room 1240. | ok | Closed | | | |
| 628. | Technology | T102B | Missing speaker in stair 2005. | Will add | Closed | | | |
| 629. | Technology | T102B | Missing speakers in SPED-Classrooms 2260 and 2264. | Will add | Closed | | | |
| 630. | Technology | T102C | Missing "W" annotation for outlet next to clock in SPED-Reading room 2168B. | Will fix | Closed | | | |
| 631. | Technology | T102A | Missing hallway speakers. | Will add | Closed | | | |
| 632. | Technology | T102B | Missing hallway speakers. | Will add | Closed | | | |
| 633. | Technology | T102C | Missing hallway speakers. | Will add | Closed | | | |
| 634. | Technology | T102C | Missing speaker in stair 2065. | Will add | Open | Will add | Incomplete | |
| 635. | Technology | T103B | Missing speaker in stair-2 3005. | Will add | Open | Will add | Incomplete | |
| 636. | Technology | T103C | Missing speaker in stair-1 3065. | Will add | Open | Will add | Complete | |
| 637. | AV Systems | General | Missing key plan for all sheets. | On bottom of each plan sheet | Closed | | | |
| 638. | AV Systems | AV000 | "BP" not called out under AV Junction Box Symbols. | To be defined on following sets | Closed | | | |
| 639. | AV Systems | AV101A | AV System in media room 1240? | Added on east wall | Closed | | | |
| 640. | AV Systems | AV102B | AV system in classroom next to classroom 2224? | From Band Room 1220. On wrong layer | Closed | | | |

| Item | Discipline | DWG/Spec | Design Development | | 60% Construction Documents | | 90% Construction Documents | |
|---|---|---|---|---|---|---|---|---|
| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| 641. | Security | E501A | | | "IMS" floating in middle of custodian office / break room 1207. | This is a desk mounted device | Response Accepted. | |
| 642. | Security | E501B | | | Far right bottom corner of building, missing camera. Tags are there but missing device. | Will fix. | Complete. | |
| 643. | Security | E501C | | | DC in wall in Art room 1234. | Will fix. | Complete. | |
| 644. | Security | E501C | | | Camera in locker room 1321? | Will remove | Complete. | |
| 645. | Security | E502B | | | Door leading to STAIR-1 2005 not shown. | Will fix. | Complete. | |
| 646. | Security | E503B | | | Door leading to STAIR-1 3005 not shown. | Will fix | Complete. | |
| 647. | Security | E503C | | | Move CR and Camera out of storage room 3066. | Will correct. | Complete. | |
| 648. | Security | E503C | | | Add "E" tag om CR for Elevator 3162. | Will add E tag and add E designation on symbol list. | Complete. | |
| 649. | Technology | General | | | Add "WP" tags for all outside speakers | Will add | Complete. | |
| 650. | Technology | T102A | | | "F" tag for tel/data outlet in copy room 2010A not called out on T001 | Will add to T001 | Complete. | |
| 651. | Technology | T102B | | | Review IDF 2255 part plan. Room seems to have shrunk. | Will review with architect. | Complete. | |
| 652. | Technology | T102C | | | Review IDF 2155 part plan. Room seems to have shrunk. | Will review with architect. | Complete. | |
| 653. | Technology | General | | | Consider changing "Head End" to "MDF" on floor plans. Details on T201, T202 & T300 all reference a MDF not a Head End Room. | Will make consistent. | Incomplete | |
| 654. | Technology | T101A | | | Consider adding a wireless access node in Makerspace / shop 1134. | Will add. | Complete. | |
| 655. | AV Systems | General | | | Digital Signage? | Provided as part of FF&E technology buy out will coordinate | No devises located, confirm they will be in the 100% set | |

| Item | Discipline | DWG/Spec | Design Development | | 60% Construction Documents | | 90% Construction Documents | |
|---|---|---|---|---|---|---|---|---|
| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| | | | | | | locations with architect. | | |
| 656. | Security | General | | | | | Card reader “LD” tag not defined | |
| 657. | Security | General | | | | | Consider tagging doors (With hardware) on floorplans with door numbers and listing each door number under their corresponding typical door elevation on E500. Cross reference with door schedule. | |
| 658. | Security | E501B | | | | | No “LB” or “DB” tag on button devices in “Guidance office 1126” or “Guidance office 1125”. | |
| 659. | Security | E501A | | | | | No “LB” or “DB” tag on button device in “custodian office / break 1027”. | |
| 660. | Security | E502A | | | | | No “LB” or “DB” tag on button devices in “copy 2010A” or “Office – Principal 2014”. | |
| 661. | Security | General | | | | | Consider adding cameras in all IDF and MDF rooms. | |
| 662. | Technology | T101C | | | | | Add speaker in “Art Workroom 1233”. | |
| 663. | Technology | General | | | | | Is plywood backboard needed for IDF and MDF rooms? | |
| 664. | Technology | General | | | | | Create BDA riser diagram. | |
| 665. | Technology | T102C | | | | | Add wireless access node in | |

| Item | Discipline | DWG/Spec | Design Development | | 60% Construction Documents | | 90% Construction Documents | |
|---|---|---|---|---|---|---|---|---|
| | | | OPM Comment | Designer Response | OPM Comment | Designer Response | OPM Comment | Designer Response |
| | | | | | | | "Science classroom 2210" | |
| 666. | Technology | T300 | | | | | Schedule's do not show device quantities. | |
| 667. | Technology | T102D | | | | | In "Gymnasium 1302" say "See DWG. T201D for technology layout in gymnasium" -- Drawing T201D doesn't exist. | |
| 668. | Technology | T102D | | | | | Projector not shown in "Auditorium 1340". Should at least be showing a data drop. | |
| 669. | Technology | T102D | | | | | "CLG" tag on data outlet not defined. | |

# Fuller Middle School

## Constructability and Drawing Review Log, 90% CDs

As of: **10/7/2019**

Revision:

CONSIGLI Est. 1905

| ITEM # | | DATE OPENED | DWG NO/DTL OR SPEC SECTION | DESCRIPTION | BIC | DATE RESOLVED | COMMENTS |
|---|---|---|---|---|---|---|---|
| ***THEATER DRAWING REVIEW*** | | | | | | | |
| ***ARCHITECTURAL DRAWING REVIEW*** | | | | | | | |
| 1 | snapshot | 9/26/19 | A001 | Call out Ceiling Layout Plan on RCP's / Relocate to RCP Series | | | |
| 2 | snapshot | 9/26/19 | A316 | Confirm Glass Types (typical); Type "Q1" does not appear in Spec 084313 | | | |
| 3 | snapshot | 9/26/19 | A102C | Show blowup detail of required furring; Wall Type D6 does not indicate furring | | | |
| 4 | snapshot | 9/26/19 | 2/A419 | Clarify ceiling types - appears multiple layers cross-hatching over one another | | | |
| 5 | snapshot | 9/26/19 | A181D | Confirm Light Fixture Types in IT/AV Rooms; LR2 indicated on Legend on Right of Sheet as Recessed, but areas are exposed to deck above | | | |
| 6 | snapshot | 9/26/19 | A182 | Review Corridor LR2 layout; Not currently aligned with ceiling grid | | | |
| 7 | snapshot | 9/26/19 | A182B | Detail 6 on Sheet A690 does not account for spray fireproofing on beams with respect to soffit framing | | | |
| 8 | snapshot | 9/26/19 | A183B | Remove Note 7.18 for Intumescent paint at Commons/Breakout areas (Intumescent only where exposed through skylights per Early Release Steel Package) | | | |
| 9 | snapshot | 9/26/19 | A183C | Remove Note 7.18 for Intumescent paint at Commons/Breakout areas (Intumescent only where exposed through skylights per Early Release Steel Package) | | | |
| 10 | snapshot | 9/26/19 | A211 | Confirm Relieving Angles shown per Structural Set (depicted here as continuous vs. individuals shown on Early Release Steel package). | | | |
| 11 | snapshot | 9/26/19 | A300 | A300-Series Sections/Details incomplete; Need to review waterproofing/flashing details fully developed | | | |
| 12 | snapshot | 9/26/19 | A314 | Provide Key/Legend for Storefront Types tying back to Sheet A221 | | | |
| 13 | snapshot | 9/26/19 | A403 | Typical P-4 Drinking Fountain not scheduled to include bottle filler; OK with City? | | | |
| 14 | snapshot | 9/26/19 | 6/A410 | Provide blow-up dimensioned detail for typical device layout for clocks/switches/etc. next to door | | | |
| 15 | snapshot | 9/26/19 | 3/A410 | Provide blowup dimensioned layout plan for devices/outlets at typical Teaching Wall | | | |
| 16 | snapshot | 9/26/19 | 5/A411 | Provide blowup of typical Emergency Shower / Eye Wash Station, Alcove to comfirm ADA compliance | | | |
| 17 | snapshot | 9/26/19 | 1/A413 | Confirm door(s) to Chorus Room 1224 don't need to be oversized to allow access for intended Piano | | | |
| 18 | snapshot | 9/26/19 | A413 | Details 2 & 11 - Soffit construction required at Chorus / Band Rooms (Potential VM Items)? | | | |
| 19 | snapshot | 9/26/19 | A414 | Possible to use Acoustic Fabric Panel in lieu of Cementitious (Possible VM Item, just use different color)? | | | |
| 20 | snapshot | 9/26/19 | A426 | Provide typical ceiling grid detail at light fixtures to identify what is required by ACT bidders to support lights (typ). | | | |
| 21 | snapshot | 9/26/19 | A431 | Eliminate angled/hourglass shape of breakout space as potential VM Item | | | |
| 22 | snapshot | 9/26/19 | A440 | Provide blowup detail for layout/blocking of various toilet accessories with respect to toilet | | | |
| 23 | snapshot | 9/30/19 | A460 | Is it ok to recess in the bearing curve? | | | |
| 24 | snapshot | 9/30/19 | A461 | No ceilings here; confirm if a specialty height of plywood is required (i.e. 8' AFF). | | | |
| 25 | snapshot | 9/30/19 | A462 | Provide indication of whether wall is flat or sloped with concrete on 6/A602. | | | |
| 26 | snapshot | 9/30/19 | A470 | VE opportunity: VE down from perforated metal at egress stairs #1 and #2. | | | |
| 27 | snapshot | 9/30/19 | A490 | Will the Fuller Middle School lettering be visible behind the railings? | | | |
| 28 | snapshot | 9/30/19 | A502 | Trade Bidder must carry temporary roof (boiler room is below) | | | |
| 29 | snapshot | 9/30/19 | A520 | Potential soffit / framing conflict. | | | |
| 30 | snapshot | 9/30/19 | A521 | Provide information on frequency of attachments. These hang from blocking above. | | | |
| 31 | snapshot | 9/30/19 | A522 | Incomplete details. | | | |
| 32 | snapshot | 9/30/19 | A522 | Provide details / sections. | | | |
| 33 | snapshot | 9/30/19 | A530 | AVB Support? | | | |
| 34 | snapshot | 9/30/19 | snapshot | Provide direction as to whether this joint is to be caulked. | | | |
| 35 | snapshot | 9/30/19 | A530 | Provide layout plans for wall jogs; degrees are not reliable for masons. | | | |
| 36 | snapshot | 9/30/19 | A531 | Provide detail as to how AVB gets supported. Is there a gap in insulation? | | | |
| 37 | snapshot | 9/30/19 | A532 | Confirm wood blocking, Z-furring, AVB scope. | | | |
| 38 | snapshot | 9/30/19 | A541 | Is this acceptable per the skylight manufacturer? | | | |
| 39 | snapshot | 9/30/19 | A541 | Is blocking required or as drawn? | | | |
| 40 | snapshot | 9/30/19 | A541 | Confirm 1/2" vs. 5/8" required (typ.) | | | |
| 41 | snapshot | 9/30/19 | A541 | Clarify scope required. | | | |
| 42 | snapshot | 9/30/19 | A541 | Adjust dimentions to allow soffit past soffit. | | | |
| 43 | snapshot | 9/30/19 | A542 | Confirm this firestopping design is okay. | | | |
| 44 | snapshot | 9/30/19 | A543 | Confirm that this duct will be accessible. | | | |
| 45 | snapshot | 9/30/19 | A544 | N/A inside HSS Post. | | | |
| 46 | snapshot | 9/30/19 | A544 | Confirm whether this is HVAC or Roofer scope. I.E. Final seal perfromed by whom? | | | |
| 47 | snapshot | 9/30/19 | A570 | Confirim this material. (Glass?) | | | |
| 48 | snapshot | 9/30/19 | A602 | Review this detail; this insulation condition does not work. | | | |
| 49 | snapshot | 9/30/19 | A602 | How will the fin tube be accessed for maintenance | | | |
| 50 | snapshot | 9/30/19 | A640 | Rough surface for hands. | | | |
| 51 | snapshot | 9/30/19 | A651 | Confirm height of toe kick is adequate. | | | |
| 52 | snapshot | 9/30/19 | A652 | Confirm where this applys. Gate with magnetic hold open is not shown on fire alarm plans. | | | |
| 53 | snapshot | 9/30/19 | A690 | No SOFP shown. Is the soffit sized to accomidate? | | | |
| 54 | snapshot | 9/30/19 | A690 | Confirm light fixture throw is okay with soffit. | | | |
| 55 | snapshot | 9/30/19 | A690 | Revise to include SOFP. | | | |
| 56 | snapshot | 9/30/19 | A690 | How is this blocking supported? Potential elimination as VE opportunity. | | | |
| 57 | snapshot | 9/30/19 | A700 | UL designs are needed for fire-rated partitions in order to comply with building code fire-stopping requirements. | | | |
| 58 | snapshot | 9/30/19 | VT01 | GGD: Need HVAC design for ventilation of hoistway for current elevator code. | | | |
| 59 | snapshot | 9/30/19 | FS100 | Show location on HVAC and Roof plans. | | | |
| 60 | snapshot | 9/30/19 | FS101 | Show this on HVAC & Roof Plans. | | | |
| 61 | snapshot | 9/30/19 | FS101 | Shoud be by roofer. | | | |
| 62 | snapshot | 10/1/19 | 1/A690 | Custom angle not adjusted to standard 45 degree per 60% CD comments. | | | |

# Fuller Middle School

## Constructability and Drawing Review Log, 90% CDs

As of: **10/7/2019**

Revision:

CONSIGLI Est. 1905

| ITEM # | | DATE OPENED | DWG NO/DTL OR SPEC SECTION | DESCRIPTION | BIC | DATE RESOLVED | COMMENTS |
|---|---|---|---|---|---|---|---|
| 63 | snapshot | 10/2/19 | Snapshot | Review 36" service clearance requirements for electrical. | | | |
| ***STRUCTURAL DRAWING REVIEW*** | | | | | | | |
| 1 | snapshot | 9/25/19 | S503 | Architect confirm dimension from top of structural steel to top of dunnage steel to account for roof insulation thickness / snow drifting | | | |
| ***FIRE PROTECTION DRAWING REVIEW*** | | | | | | | |
| 1 | snapshot | 9/25/19 | FP001 | Note #6 - What flow data was used to complete current design? | | | |
| 2 | snapshot | 9/25/19 | FP101A | Wet Sprinkler system OK in Main Electric / Emergency Elec / Head End Rooms? | | | |
| 3 | snapshot | 9/25/19 | FP101B | Note for Window Sprinklers - Where does "Typical" apply? All required locations must be shown, with associated piping | | | |
| 4 | snapshot | 9/25/19 | FP101C | Sprinkler Heads under balconies / walkways / breakout spaces should identify required piping | | | |
| 5 | snapshot | 9/25/19 | FP101D | Confirm no sprinkler coverage required under Stage / Extension | | | |
| 6 | snapshot | 9/25/19 | FP101D | Confirm Sprinkler location vs. Fin tube under windows | | | |
| 7 | snapshot | 9/25/19 | FP102A | Confirm auxiliary drain necessary? Are others required, as this is only location shown in set; If needed for this pipe run, is Exam Room acceptable location? | | | |
| 8 | snapshot | 9/25/19 | FP102A - | FP Piping passes thru CMU bearing wall in two locations this area; Confirm acceptable with Structural Engineer, provide sleeving detail | | | |
| 9 | snapshot | 9/25/19 | FP104C | Sprinkler Head shown in Elevator Roof Vestibule; Confirm Wet vs. Dry System; HVAC Plans do not currently show means to heat this space | | | |
| 10 | snapshot | 9/25/19 | FP101C | Confirm no special FP requirements for Kiln in Art Workroom 1233 | | | |
| ***PLUMBING DRAWING REVIEW*** | | | | | | | |
| 1 | snapshot | 9/25/19 | 2/P005 | Confirm HVAC Plans to be updated to show required BMS tie-ins | | | |
| 2 | snapshot | 9/25/19 | P101A | Bollards Required at Gas Meter? None shown on Arch/Landscape Plans | | | |
| 3 | snapshot | 9/25/19 | P101A | Rain Leader cleanout OK in Dry Storage Room? | | | |
| 4 | snapshot | 9/25/19 | P101D | Rain Leader thru CMU Bearing Wall acceptable to Structural? Provide sleeving/lintel information if required | | | |
| 5 | snapshot | 9/25/19 | P102A | Additional Steel support required at TD-1's? | | | |
| 6 | snapshot | 9/25/19 | P102D | Review Rain Leader Cleanout Access Acceptable | | | |
| 7 | snapshot | 9/25/19 | P102D | Confirm Rain Leader across backstage area OK with theatre rigging / productions | | | |
| 8 | snapshot | 9/25/19 | P103B | Review Rain Leader riser location for possible conflict with Architectural | | | |
| 9 | snapshot | 9/25/19 | P103B | Confirm riser stack core spacing requirements with Structural | | | |
| 10 | snapshot | 9/25/19 | P103C | Vent Sizing does not appear to fit inside stud cavity; Confirm partition types don't need to change | | | |
| 11 | snapshot | 9/25/19 | P104 | No overflow drains required on roof? | | | |
| ***HVAC DRAWING REVIEW*** | | | | | | | |
| 1 | snapshot | 9/25/19 | M101B | Specify any different requirement for look of visible ducts where passing into Breakout Spaces (type of finish, insulation, etc.) | | | |
| 2 | snapshot | 9/25/19 | M101B | Confirm Free Area SF total vs. per louver | | | |
| 3 | snapshot | 9/25/19 | M101B | Specify "DG" for grilles on doors, if to be provided by HVAC vs. door supplier | | | |
| 4 | snapshot | 9/25/19 | M101C | Confirm HVAC requirements for Kiln to be installed in Art Workroom 1233 | | | |
| 5 | snapshot | 9/25/19 | M302 | DD-7 Diffusers are radius-style in rounded corner of typical classroom; Notes in schedule / drawing sheet graphics do not indicate custom nature of grille | | | |
| 6 | snapshot | 9/25/19 | M302 | Does minumum CFM column need to be completed in the VAV Schedule? | | | |
| 7 | snapshot | 9/25/19 | M104 | Confirm no access required within "Enclosure"; Duct will be very difficult to access (if not inaccessible) from 3rd Floor corridor | | | |
| 8 | snapshot | 9/25/19 | M201B | Why does Note #6 exist? T-stats and/or CO2 sensors should be shown wherever required | | | |
| 9 | snapshot | 9/25/19 | M201B | What is interaction between soffits, lights, radiant panels in room like this where no ACT ceiling exists? | | | |
| 10 | snapshot | 9/25/19 | M301 | Clarify specifications for factory painted items (standard range vs. custom colors) | | | |
| 11 | snapshot | 10/2/19 | M101A | Review finished ceiling elevation vs. cavity space. Duct may not fit tapping off the top or bottom. Typical in multiple areas in main corridor. | | | |
| 12 | snapshot | 10/2/19 | M101B | Service access appeard to blocked on both sides. | | | |
| 13 | snapshot | 10/2/19 | M101B | VAV 1-16 appears to have the controls on top of the equipment. Is this the contract intent? If so, 36" from the deck will be required for access by code. | | | |
| 14 | snapshot | 10/2/19 | M101B | No FD or FSD shown on the floor or exiting the shaft. Please confirm that rating does not have to be maintained. | | | |
| 15 | snapshot | 10/2/19 | M101B | FSD not shonw on 8"x4" Hood Duct as it exits shaft. | | | |
| 16 | snapshot | 10/2/19 | M101C | VAV 6-1 may have service/controls access issues. 36" min. required by electrical code. | | | |
| 17 | snapshot | 10/2/19 | M101C | VAV 1-7 seems to have access/min. clearance issues. | | | |
| 18 | snapshot | 10/2/19 | M101C | VAV 6-3 is showing controls to wall side. Need 36" clearance by code. | | | |
| 19 | snapshot | 10/2/19 | M101C | Please review if S.A. & R.A. ducts require FD or FSD as they enter the space or the bathrooms further down stream. | | | |
| 20 | snapshot | 10/2/19 | M101C | VAV 1-16 shows controls on topo of the equiment. 36" min. clearance is required by code. | | | |
| 21 | snapshot | 10/2/19 | M102B | Controls acces shown to wall side. Need 36" min. by code. | | | |
| 22 | snapshot | 10/2/19 | M102B | VAV 2-25 may not have minimum require clearance for controls on either side. | | | |
| 23 | snapshot | 10/2/19 | M102B | VAV 2-19 controls locatioin may have to be flipped. | | | |
| 24 | snapshot | 10/2/19 | M102B | What is the intent of this vertical ductwork (Toilet 2150). Seems to be out of place. | | | |

# Fuller Middle School

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|---|---|---|---|---|---|---|---|
| 25 | snapshot | 10/2/19 | M102B | IDF 2155 is not showing any type of temperature contro or ventilation. Confirm that it is not required. | | | |
| 26 | snapshot | 10/2/19 | M102B | VAV 2-13 is straddling a wall. Walls are full deck height. | | | |
| 27 | snapshot | 10/2/19 | M102B | VAV 2-17 may not comply with minimum required clearance for electrical. | | | |
| 28 | snapshot | 10/2/19 | M102B | VAV 2-11 may not have the min. required clearance for electrical as drawn. | | | |
| 29 | snapshot | 10/2/19 | M102B | VAV 2-18 may not have the required min. clearance for electrical. | | | |
| 30 | snapshot | 10/2/19 | M102C | No liner shown between SA and unit connection on return side for noise purposes. Confirm not required. | | | |
| 31 | snapshot | 10/2/19 | M102C | Branch ductwork not shown. | | | |
| 32 | snapshot | 10/2/19 | M102D | 34"x18" will be in conflict with toilet and toilet partition if the path is to continue down as shown on note. | | | |
| 33 | snapshot | 10/2/19 | M102D | No FSD shown on return on 20x12 duct exiting shaft. | | | |
| 34 | snapshot | 10/2/19 | M102D | VAV 2-34 may not have the min. required clearance for electrical. | | | |
| 35 | snapshot | 10/2/19 | M102D | No FSD shown as exhaust ducts exit shaft. Confirm that it is not required. | | | |
| 36 | snapshot | 10/2/19 | M102D | No FSD sown as exhaust ducts exit shaft. Confirm that it is not required. | | | |
| 37 | snapshot | 10/2/19 | M102D | VAV 4-36 will not have the min. required clearance for electrical as drawn. Wall on controls side; access door thru wall would be required. | | | |
| 38 | snapshot | 10/2/19 | M103A | No FSD shown. Confirm not required. | | | |
| 39 | snapshot | 10/2/19 | M103A | VAV 3-16 is straddling wall. All walls go to the deck. | | | |
| 40 | snapshot | 10/2/19 | M103A | VAV 3-17 may not comply with min. electrical clearance requirements as shown. | | | |
| 41 | snapshot | 10/2/19 | M103A | VAV 3-18 may have an electrical access issue as shown. | | | |
| 42 | snapshot | 10/2/19 | M103A | VAV 3-19 may have an electrical access issue as shown. | | | |
| 43 | snapshot | 10/2/19 | M103A | 3x14 duct will have to be shifted to not run above wall. | | | |
| 44 | snapshot | 10/2/19 | M103A | VAV 3-27 & VAV 3-22 will have electrical access issues as shown. | | | |
| 45 | snapshot | 10/2/19 | M103B | VAV 2-35 is stradding the wall. Walls to be deck height. | | | |
| 46 | snapshot | 10/2/19 | M103B | VAV 4-36 is straddling a full height wall and will have electrical access issues as shown. | | | |
| 47 | snapshot | 10/2/19 | M103B | No FSD sown as duct enters shafts or as it enters the building from the roof. Confirm that they are not required. | | | |
| 48 | snapshot | 10/2/19 | M103B | VAV 4-39 is straddling a full height wall. | | | |
| 49 | snapshot | 10/2/19 | M103B | VAV 4-43 is straddling a full height wall and controls does not have the min. required electrical access as drawn. | | | |
| 50 | snapshot | 10/2/19 | M103B | Duct SMoke Detectors not shown. Confirm that they are not required. (Typical with all rooftop equipment). | | | |
| 51 | snapshot | 10/2/19 | M103B | Louvers for smoke indicate approximate free face area required, but do not indicate dimension (Typical thru job). | | | |
| 52 | snapshot | 10/2/19 | M103C | No FSD's or FD's shown at roof or shaft penetration. Confirm this is not required. | | | |
| 53 | snapshot | 10/2/19 | M103B | VAV 1-29 is straddling a full height wall and may pose electrcial access issues. | | | |
| 54 | snapshot | 10/2/19 | M103C | VAV 1-33 may pose an electrical access issue i elevation is same as 24x14 duct. | | | |
| 55 | snapshot | 10/2/19 | M103C | VAV 1-35 is straddling a full height wall. | | | |
| 56 | snapshot | 10/2/19 | M103C | Detail needed to show how to run duct and connect the diffusers in the Breakout 3068 and Breakout 3058. It needs to show interiors work associated to the rooms. | | | |
| 57 | snapshot | 10/2/19 | M103C | VAV 2-33 appears to have electrical access issues as shown. | | | |
| 58 | snapshot | 10/2/19 | M103C | No FSD shown as 20x12 duct exits shaft. Duct is shown going down, which appears to in conflict with door. | | | |
| 59 | snapshot | 10/2/19 | M103C | 34x18 S.A. Duct DN. this appears to be conflict with toilet and partitions below. | | | |
| 60 | snapshot | 10/2/19 | M103C | VAV 2-35 is straddling full height wall. | | | |
| 61 | snapshot | 10/2/19 | M103C | Ductwork does not show FSD as it exits shaft. Confirm none are required. | | | |
| 62 | snapshot | 10/2/19 | M103D | No FSD shown on duct exiting shaft. Confirm that it is not required. | | | |
| 63 | snapshot | 10/2/19 | M103D | No duct smoke detector shown on drawings. COnfirm that they are not required. | | | |
| 64 | snapshot | 10/2/19 | M104 | A detail for the dog house will be required for pricing purposes for RTU-5/6. Not something usually provided by mechanical contractor. | | | |
| | | | | | | | |
| ***ELECTRICAL DRAWING REVIEW*** | | | | | | | |
| 1 | snapshot | 9/25/19 | E101D | Confirm no lighting required for ends of aisles/seating in Auditorium | | | |
| 2 | snapshot | 9/25/19 | E102D | Are this many occupancy sensors necessary in Gymnasium? | | | |
| 3 | snapshot | 9/25/19 | E103B | Is this quantity of SP1 light fixtures required? What is detail at lockers vs. railings locations around atrium? | | | |
| 4 | snapshot | 9/25/19 | E103D | Lighting Plans stop at 3rd Floor; Confirm no lighting required at Roof Level | | | |
| 5 | snapshot | 9/25/19 | E201A | Review outlet locations vs. Borrowed Lite / Furniture adjacent to Boiler Room | | | |
| 6 | snapshot | 9/25/19 | E201A | Overhead door at Maker Space by not at Loading Dock; Confirm acceptable to school | | | |
| 7 | snapshot | 9/25/19 | E201D | Specify height AFF to avoid confusion | | | |
| 8 | snapshot | 9/25/19 | E201D | No power required for Auditorium Seating / Aisle lighting? | | | |
| 9 | snapshot | 9/25/19 | E202A | Are these switched receptacles? Is this OK with school? | | | |
| 10 | snapshot | 9/25/19 | E203A | Architecturals should include typical elevation view of teaching wall referenced for electrical outlet layout | | | |
| 11 | snapshot | 9/25/19 | E203A | Architecturals should include typical elevation view of classroom entry door/wall referenced for electrical outlet layout | | | |
| 12 | snapshot | 9/25/19 | 6/E300 | Check clearance at panel vs. door swing; Review if wall behind panel ELP1D should be frame parallel to door to improve clearances | | | |
| 13 | snapshot | 9/25/19 | E300 | Review plywood backerboard requirements at electrical/IDF Rooms; 8-ft tall plywood OK in lieu of floor-to-ceiling? | | | |
| 14 | snapshot | 9/25/19 | E401A | No Carbon Monoxide Detector required in Boiler Room 1018? | | | |
| 15 | snapshot | 9/25/19 | E401B | Are this many fire alarm horn/strobes actually required in the corridors surrounding the Atrium? | | | |
| 16 | snapshot | 9/25/19 | E403D | Fire Alarm Plans stop at 3rd Floor; Confirm no Fire Alarm devices required at Roof Level. | | | |
| 17 | snapshot | 9/26/19 | E400 | No BDA System shown; Confirm not required by Framingham Fire Dept | | | |
| 18 | snapshot | 9/26/19 | E400 | Confirm Framingham Fire Dept requirements for Master Box and/or Knox box | | | |
| 19 | snapshot | 9/26/19 | LS001 | Information missing RE: Interior Wall & Ceiling Finishes | | | |
| 20 | snapshot | 9/26/19 | LS001 | Confirm Stage Exhaust requirements captured in HVAC plans | | | |
| 21 | snapshot | 9/26/19 | E003-1 | Dumpster Pad shown on Sheet C-4.1; Confirm no power required for compactor-style dumpster | | | |

# Fuller Middle School

Constructability and Drawing Review Log, 90% CDs

As of: **10/7/2019**

Revision:

| ITEM # | DATE OPENED | DWG NO/DTL OR SPEC SECTION | DESCRIPTION | BIC | DATE RESOLVED | COMMENTS |
|---|---|---|---|---|---|---|
| ***LANDSCAPE DRAWING REVIEW*** | | | | | | |
| ***SPECIFICATIONS*** | | | | | | |
| | | | | | | |
| | | | | | | |
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### 2.1.2 Commissioning Agent Review

The Commissioning Agent, Jacobs, performed a review of the Progress 90% Construction Documents, dated September 9, 2019. The Commissioning Agent's comments are documented in the Commissioning Agent Review, dated October 14, 2019 and appended to the end of this section.

The Commissioning Agent's recommendations will be incorporated into the 100% Construction Documents submission.

| Item | Initials | Reference | 100% DD Comments | 100% DD Response | Action | 60% CD Comments | 60% CD Response | 90% CD Comment | 90% CD Response |
|---|---|---|---|---|---|---|---|---|---|
| **SPECIFICATIONS** | | | | | | | | | |
| **DIVISION 01** | | | | | | | | | |
| S-1 | JAH | 011000 | Section 1.2.: Several spec sentences indicate a value by listing "**xxx**". Please review and add required values. | Specs will be further refined for 100% DD Set | CLOSED | To be verified as design progresses | Refer to 100% DD response – no change in response comment. | | |
| S-2 | JAH | 011000 | Section 1.3.A.c: A reference is made to spec 018113. This spec did not appear to be included with the design package (ref. Vol. 1). Please review and reconcile. | This section will be included in 100% DD Set | CLOSED | To be verified as design progresses | Refer to 100% DD response – no change in response comment. | | |
| S-3 | JAH | 011000 | Section 1.3.A.: LEED is indicated , however the level of LEED compliance did not appear to be indicated. Please review and reconcile. | Will be defined in 100% DD Set | CLOSED | To be verified as design progresses | Refer to 100% DD response – no change in response comment. | | |
| S-4 | JAH | Div 1 specs | It is suggested that several Div. 1 specs, not currently listed in the TOC, should be added to the design package (ref. Vol. 1). As a minimum, suggest adding specs: 013100 Project Management and Coordination; 013300 Submittal Procedures; 017300 Execution; 017700 Closeout Procedures; 017836 Warranties; and 018113 Sustainable Design requirements. If contents of above-noted additions do not adequately cover Operation and Maintenance manuals and Training requirements, it is also suggested that specs for these be provided. | Additional sections will be included in 100% DD Set | CLOSED | To be verified as design progresses | Refer to 100% DD response – no change in response comment. | | |
| S-5 | JRC | General Comment | Many spec sections reviewed has an incorrect section number for Part 3 - Execution. Many sections reviewed start with either 3.2 or 3.3. Suggest reviewing and correcting as required. | Specs will be further refined for 100% DD Set | CLOSED | To be verified as design progresses | Refer to 100% DD response – no change in response comment. | | |
| S-6 | JRC | General Comment | Please define where requirements are for submitting shop drawings. These are not provided for in the volume 1 specification sections reviewed. | Will be defined in 100% DD Set | CLOSED | To be verified as design progresses | Refer to 100% DD response – no change in response comment. | | |
| **DIVISION 04** | | | | | | | | | |
| S-7 | JRC | 04 20 00 | Confirm if wetting brick based on IRA testing will be allowed | For veneer layout it is not anticipated that wetting brick will be required as the specifications require an IRA of less than 30. Fully grouted brick areas at the base of the building are to be wetted prior to grout installation. | CLOSED | | Refer to 100% DD response – no change in response comment. | | |
| S-8 | JRC | 04 20 00-4 | Special shapes - confirm number of shapes and confirm that cutting is not allowed. | Special shapes are documented on sheet A501. Additional shapes may be added during CD's if warranted (stair towers). Bricks may be cut where required with approval of architect. | CLOSED | | | | |
| S-9 | JRC | 04 20 00-18 | Consider using the proper term for masonry joints - Masonry Institute states that Brick Expansion Joints (BEJ) is the proper term for clay masonry products. | JLA to review. | CLOSED | | It has been JLAs experience that “control joint” is the common use terminology for this type of masonry joint and distinguishes itselt separately from the more substantial building structural “expansion joint”. | | |
| **DIVISION 07** | | | | | | | | | |
| S-10 | JRC | 072100-2 | Specification notes that the thickness of the insulation is as noted on the drawings. Please confirm that the designed system will provide minimum continuous R value as required by the energy code. | The DD energy model is based on the R values indicated in the drawings. Glazed areas have been reduced significantly and mid level shading has been removed to satisfy value engineering requirements. The energy model will be re-run at 60% CD to confirm compliance with the energy code. | CLOSED | | The insulation will be continuous and the energy model will meet code and project requirements. | | |
| S-11 | JRC | 074254 | Suggest that coordination guidelines for phenolic wall panels and intersection with other materials such as the aluminum curtainwall and the face brick construction be included in Part 3 - Execution, as they apply. | This will be reviewed and provided in the 60% DD set. The design elevations are being finalized for DD based on value management requirements (the phenolic panels have been reduced significantly). | CLOSED | | Relevant instructions will be included in the specifications | | |
| **DIVISION 08** | | | | | | | | | |
| S-12 | JRC | 084313 | Basis of design is the Kawneer Trifab 451UT system, Center glazed. Note that this does not match the system description of flush or outside glazed system. Please confirm intent. Please review drawing comments regarding integration of framing system with exterior wall materials. | Storefront is intended for use in the interior vestibulels only. The exterior wall line will be curtain wall. | CLOSED | | The basis of design has been modified to Oldcastle 6000 XT as curtain wall has been removed from the project. | | |
| **DIVISION 22** | | | | | | | | | |
| S-13 | WGH | 22 00 00 | Section 2.28 Elevator Sump Pump: Consider specifying the required oil minder control panel's ancillary components | Will comply. | CLOSED | Sump Pump specification section appears removed. Is this still in scope? | Elevator sump pump is included in 90% specification | | |
| S-14 | WGH | 22 00 00 | Section 2.28 Elevator Sump Pump: Consider specifying the required oil minder control panel's ancillary components | Will comply. | CLOSED | Redundant Comment. | | | |
| S-15 | WGH | 22 00 00 | Section 2.28 Elevator Sump Pump: Consider integrating the control panel alarms with the building management system. | Agree. Panel will be integrated in BMS. | OPEN | Sump Pump specification section appears removed. Is this still in scope? | Elevator sump pump is included in 90% specification.<br>Control panel will integrate with BMS | Elevator sump pump control panel intregration with BMS not indicated in specs section. | |
| S-16 | WGH | 22 00 00 | 2.31 Acid Neutralization System: Consider integrating the control panel alarms with the building management system. | Control panel alarm will be connected to BMS. | OPEN | Control panel interface is not included in specifications. Comment is still OPEN. | Control panel alarm interface will be included in the 90% specification | Control panel interface is not included in specifications. | |
| **DIVISION 23** | | | | | | | | | |
| S-17 | KML | 23 00 00 TOC | Table of Contents does not indicate various spec sections (listed as single section "23 00 00 - HVAC"). Suggest updating TOC with specific sections. | Will review and revise table of contents. | CLOSED | Division 23 TOC included at the beginning of section. | | | |

| Item | Initials | Reference | 100% DD Comments | 100% DD Response | Action | 60% CD Comments | 60% CD Response | 90% CD Comment | 90% CD Response |
|---|---|---|---|---|---|---|---|---|---|
| S-18 | KML | 23 00 00 Part 2.12.J.7.gg | Chiller controls section indicates "Optional" features. Included in this section is line item 1, which is BMS interface with BACnet or LonTalk. Please verify is this is an optional feature from the chiller manufacturer that is required for the project, or optional for the project. If optional for the project, consider making this a requirement for consolidate system monitoring and operation. | This feature is an optional feature from the manufacturer. Will clarify specifications. | CLOSED | | | | |
| S-19 | KML | 23 00 00 Part 2.12 | Chiller startup requirements call for two working days to ensure proper operation of equipment and owner training. Suggest including coordination with control contractor for integration with BMS during manufacturer's startup. | Will review and revise start-up requirements to coordinate with controls contractor. | CLOSED | Comment still OPEN. | GGD: This has been added to the 90% set. | | |
| S-20 | KML | 23 00 00 Part 2.13.B.2 | Roof Top Air Handling Unit General Description calls for the units to be provided with "e. Modulating direct expansion cooling coil section" and "h. Chilled water cooling coil." Please confirm number of chilled water coils required and remove redundant items. | Will review and remove redundant items. | CLOSED | Comment still OPEN. | GGD: This has been added to the 90% set. | | |
| S-21 | KML | 23 00 00 Part 2.13.Q | Roof Top Air Handling Unit controls sections calls for "All sensors, actuators, controls shall be provided by the ATC/DDC controls subcontractor. AHU General Description section calls for units to be factory assembled and tested. Please verify if controls will be packaged with unit or field-installed custom controls and associated scope of the controls subcontractor. | Will review and revise provisions of controls. | CLOSED | Comment still OPEN. | GGD: ATC subcontractor shall coordinate with HVAC contractor to provide any controls items that RTU manufacturer cannot provide. | | |
| S-22 | WGH | 23 00 00 Part 2.13P | | | CLOSED | This specification section refers to 23 00 00 Part 2.3 for Roof Curb requirements. Part 2.3 specifies Meters and Gages.<br>CxA suggests rooftop unit roof curb requirements be included with the specifications and coordinated with the drawing notes and details. Refer to comments #89a and #93. | GGD: Specification reference will be updated to specification 23 05 48 paragraph 2.2.A.22 - Roof Curb specification & drawing details. | | |
| S-23 | KML | 23 00 00 Part 2.14 | Hydronic Terminal Heating Units controls not specified for all types of equipment (devices, setpoints, integration with BMS, etc.). Suggesting noting if equipment is to be provided with packaged controls and no BMS interface. | Will review to see if this is needed. | CLOSED | Comment still OPEN. | GGD: A general note has been added to refer to control drawings for all terminal heating units. | | |
| S-24 | KML | 23 00 00 Part 2.16 | Power and Gravity Ventilators section does not indicate motor/drive integration with BMS. Consider including integration requirement for fans equipped with variable frequency drives (status, speed, alarms, etc.). | Will review to see if this is needed. | CLOSED | Comment still OPEN. | GGD: A general note has been added to refer to control drawings for all fans equipped with VFD's. | | |
| S-25 | KML | 23 00 00 Part 2.24 | Please confirm if Ductless Cooling Units will have any interface with the BMS (space temperature, unit status, alarms, etc.) | Ductless cooling units will interface with BMS. We will review the specifications to ensure this is indicated. | OPEN | Updated ductless split specifications does not include BMS interface. This is a common gap in coordination. CxA suggest this is clarified. | GGD: Specification notes will be revised to refer to control drawings for ductless cooling units interface with BMS. | Ductless cooling units integration with BMS not specified. | |
| S-26 | KML | 23 00 00 Part 3.14 & 3.15 | Sections appear to be redundant ("Installation of HVAC Rooftop Units" vs. "Installation of Rooftop Air Handling Units") | Will review and revise/remove redundant information. | OPEN | Comment still OPEN. | GGD: This has been corrected on the 90% set. | Section removed, but still included in Table of Contents so subsequent section numbering is off. | |
| S-27 | KML | 23 00 00 | Sequence of operation not provided for all equipment and systems. To be reviewed once complete. | Sequence of operations are underway. | CLOSED | | | | |
| S-28 | WGH | 28 00 00 Part 1.3D | | | CLOSED | Related sections include Division 23 "HVAC Instrumentation and Controls. Section 23 00 00 Part 2.29 includes Automatic Temperature Controls.<br>CxA suggests these sections be coordinated for clarity. | GGD: Reference has been updated. | | |
| | | | | | | **DIVISION 26** | | | |
| S-29 | JAH | 260000 | Section 1.2 C.: A reference is made to spec 012300. This spec did not appear to be included with the design package. Please review and reconcile | Division 012300 is typically for alternates. We will review and edit as required. | OPEN | To be verified as design progresses | GGD: We have removed all references to 01 23 00 as there is no such section on the project. | Reference still exists in spec section 26 00 00 1.2C. | |
| S-30 | JAH | 260000 | Section 1.3.B: Suggest adding text……"Provide all necessary coordination with other trades and the architect." | Done | CLOSED | | | | |
| S-31 | JAH | 260000 | Section 1.3.B.10: Suggest adding text…."Provide and coordinate required electrical manufacturer's site testing and installation verifications. Identify and coordinate any Factory testing and make provisions for necessary site personnel (e.g., maintenance personnel, client, Cx agent, and engineer of record) to attend FAT execution. | Done | CLOSED | | | | |
| S-32 | JAH | 260000 | Section 1.3.B.26: Suggest adding text…."Provide all necessary technical and material support for the commissioning of the project's electrical components and systems. | Done | CLOSED | | | | |
| S-33 | JAH | 260000 | Sections 1.3.B.25 & 1.7: A reference is made to spec 018113. This spec did not appear to be included with the design package. Please review and reconcile. | We will review this reference and correct as required. | CLOSED | To be verified as design progresses | GGD: 01 81 13 refers to sustainable design requirements | | |
| S-34 | JAH | 260000 | Section 1.3.B.14: A reference is made to specs 116133, 116191, and 266111. These specs did not appear to be included with the design package. Please review and reconcile. | We will review these references and correct as required. | CLOSED | To be verified as design progresses | GGD: 11 61 33 refers to Theatrical Rigging, 11 61 91 refers to Theatrical lighting instruments and accessories, 26 61 11 refers to Theatrical Lighting controls | | |
| S-35 | JAH | 260000 | Section 1.8: A reference is made to spec 018111. This spec did not appear to be included with the design package. Please review and reconcile. | We will review this reference and correct as required. | OPEN | To be verified as design progresses | GGD: There is no such section all references to this section will be removed. | Reference still exists in spec section 26 00 00 1.8A.3. | |

| Item | Initials | Reference | 100% DD Comments | 100% DD Response | Action | 60% CD Comments | 60% CD Response | 90% CD Comment | 90% CD Response |
|---|---|---|---|---|---|---|---|---|---|
| S-36 | JAH | 260000 | Section 1.3. B. 30: Add line item indicating …"Work required for Lightning protection and building grounding, including grounding tests and lightning protection certification." | Lightning preventor system has been added. The project will not have a lightning protection system. | OPEN | Please clarify what is provided for a Lightning Preventor System - UL master label only refers to Ltng Protection sys. | GGD: Lighting preventor system manufacturer provides upon completion of installation and required inspection and tests that the system meets HPB-21, Levels 1&2 a certificate of Guarantee catastrophe umbrella policy that guarantees the preventor lighting protection system with an insurance policy of $10,000,000.00. The guarantee is limited to the structural building and also excludes surge transient protection for services. | Lightning preventor system has been added to Section 1.3 "Description of Work" as a line item, but no associated section has been included or requirements identified. | |
| S-37 | JAH | 260000 | Section 1.3. B. 20: A reference is made to spec 0150003. This spec did not appear to be included with the design package. Please review and reconcile. | We will review this reference and correct as required. | CLOSED | | | | |
| S-38 | JAH | 260000 | Section 1.8: A reference is made to spec 013100. This spec did not appear to be included with the design package. Please review and reconcile. | We wil review this reference and correct as required. | CLOSED | To be verified as design progresses | GGD: 01 31 00 refers to project management and coordination. | | |
| S-39 | JAH | 260000 | Section 1.13: It is suggested "NETA, National Electrical Testing Association" be added to the list of Codes, Ordinances, and Permits | Done | CLOSED | | | | |
| S-40 | JAH | 260000 | Section 1.16. D. It is suggested to add a new item: ... "Electrical Contractor is responsible to provide and/or install the correct designated equipment, components, and materials. Submittal approval by the engineer does not relieve the contractor from any contractual requirement to provide a complete and fully working system." | Done | CLOSED | | | | |
| S-41 | JAH | 260000 | Section 1.15: A reference is made to spec 013300. This spec did not appear to be included with the design package. Please review and reconcile. | We will review this reference and correct as required. | CLOSED | To be verified as design progresses | GGD: 01 33 00 refers to submittal procedures | | |
| S-42 | JAH | 260000 | Section 1.3 B: It is suggested to add a line item ... "Electrical Subcontractor shall conduct a light level review in the field to ensure luminaires and their footcandle readings are in accordance with project criteria and the IESNA." | Done | CLOSED | | | | |
| S-43 | JAH | 260000 | Section 1.19. A. : Division number to be provided. | Division number will be coordinated and edited. | OPEN | To be verified as design progresses | GGD: 01 50 00 temporary facilities and controls section has been referenced. | Division number not specified. | |
| S-44 | JAH | 260000 | Section 1.20.C: Add text…."Provide and coordinate required electrical manufacturer's site testing and installation verifications. Site testing protocols shall be submitted by the applicable vendor PRIOR to commencement of site tests. All completed site testing is to be properly documented with test reports submitted as a Cx pre-requisite. Identify any Factory testing and make provisions for necessary site personnel (e.g., maintenance personnel, client, Cx agent, and engineer of record) to attend FAT execution. | Done | CLOSED | | | | |
| S-45 | JAH | 260000 | Section 1.20. D: At add item…."Provide all necessary technical and material support for the commissioning of the project's electrical components and systems. After establishing a general project schedule, add pertinent details of the commissioning workplan, incorporating necessary Cx predecessors, successors, and durations. Obtain/execute/submit all required documentation necessary for Cx to commence". | Done | CLOSED | | | | |
| S-46 | JAH | 260000 | Section 1.23: A reference is made to spec 017700. This spec did not appear to be included with the design package. Please review and reconcile. | We will review this reference and correct as required. | CLOSED | To be verified as design progresses | GGD: 01 77 00 refers to closeout procedures. | | |
| S-47 | JAH | 260000 | Section 2.24: Suggest label indicate "Lightning Protection System", ***not*** "Lightning Preventer System" | A lightning protection system will not be provided. The project will include a lightning preventor system. No change necessary. | OPEN | Please clarify what is provided for a Lightning Preventor System - UL master label only refers to Ltng Protection sys. | GGD: Lighting preventor system manufacturer provides upon completion of installation and required inspection and tests that the system meets HPB-21, Levels 1&2 a certificate of Guarantee catastrophe umbrella policy that guarantees the preventor lighting protection system with an insurance policy of $10,000,000.00. The guarantee is limited to the structural building and also excludes surge transient protection for services. | Reconcile "Lightning Preventor" and "Lightning Protection" nomenclature as required. | |
| S-48 | JAH | 260000 | Section 3.4: Add text or additional item: "Ensure that equipment nameplate include date of manufacture". | Done | CLOSED | | | | |
| S-49 | JAH | 260000 | Section 3.16.H.: Clarify/describe NFPA 110 testing requirements for the generator | This is described in Part 2 of the specifications. | CLOSED | To be verified as design progresses | GGD: NFPA 110 test requirement has been added. | Included in Section 2.23.O. | |
| S-50 | JAH | 260000 | Suggest that all control points/alarms that are to be indicated at the BMS system which are derived from the generator, generator annunciator, and ATS switches be identified. | Done | CLOSED | | | | |
| S-51 | JAH | 260000 | Section 3.16.H.: Add requirement and references for NFPA 3 & 4 testing (Integrated Life Safety tests) | We will review these standards further before editing the specifications. | CLOSED | To be verified as design progresses | GGD: This would fall under commissioning | | |
| S-52 | JAH | 260000 | Suggest that all control points/alarms that are to be indicated at the BMS system which are derived from the FACP be identified. | This will be identified in the ATC control drawings point list if required. | CLOSED | To be verified as design progresses | GGD: The fire alarm system will output a single Analog out for alarm to BMS system | | |
| S-53 | JAH | 260000 | Add requirement for electrical subcontractor to provide "in process" panel schedule sheet while loads are being connected. Electrical subcontractor to review phase loading at panelboards at the end of work and prior to closeout to ensure balanced loading. Provide a final typed panel schedule at completion of work. | Done | CLOSED | | | | |
| S-54 | JAH | 260000 | Add requirement for Arc Flash study to provide required PPE/Arc Flash equipment ID labels | Already included in 3.17, we will add to this section to provide more detail. | CLOSED | | | | |
| S-55 | JAH | 260000 | Add requirement for "ring out" of all starters, controllers, circuits and sensors in coordination with BMS checkout to ensure all components properly connected and operable. | Requirement will be added. | CLOSED | To be verified as design progresses | GGD: added requirement | | |

| Item | Initials | Reference | 100% DD Comments | 100% DD Response | Action | 60% CD Comments | 60% CD Response | 90% CD Comment | 90% CD Response |
|---|---|---|---|---|---|---|---|---|---|
| S-56 | JAH | 260000 | It is suggested to add text to distribution gear nameplates (panels, switchboards, ATS units, etc.) to provide info of the gear/branch circuit that supplies it and/or which it powers. In addition, the distribution gear nameplates shall identify the year of their manufacture (required for future life cycle reviews) | Done | CLOSED | | | | |
| S-57 | JAH | 260000 | It is suggested to add text to the wiring device nameplates to include info of the panel/branch circuit that supplies it. | Done | CLOSED | | | | |
| **Drawings** | | | | | | | | | |
| **Architectural** | | | | | | | | | |
| D-1 | JRC | A-104 | As the documents continue through the CD phase please consider the layout of the roof drains, high and low points of the roof, as they relate to the roof skylights. The high point(s) and framing for the skylights will have an impact on the roof sill condition and the method of waterproofing / flashing, as well as the unusual connection at the ends of the skylights | The major roof drainage strategy will be shown in the 100% DD set. | CLOSED | | The drainage has been refined in the 60% documents. Final scupper elevations will be determined, but the overall roof edge has been held to 6" above the low point of the drain low point line. | | |
| D-2 | JRC | General Exterior Comment | As the documents continue through the CD phase please consider the number of differing plan and vertical details required due to specific material / Design considerations. Note that there are a number of air barrier details required for the maintenance of air, thermal and water separation, and proper detailing must support what appears to be a Rain Screen application with the phenolic panels. (Sheet A-501) | JLA agrees with comment. The brick and phenolic panel systems are open joint systems. | OPEN | | Refer to 100% DD response – no change in response comment. | | |
| D-3 | JRC | General Exterior Comment | It is recognized that the Design Development sections noted are raw cut from the building model. As the documents continue through the CD phase please consider the need for integration and coordination of exterior elements and structural framing. In these cases tolerances of material and construction are often overlooked. | JLA agrees with the comment. | OPEN | | Refer to 100% DD response – no change in response comment. | | |
| D-4 | JRC | A-211/A213 | A number of elevations indicate phenolic panels with aluminum curtainwall on either or both sides. Consider how the connection is designed for maintaining the air barrier and how the glass panel may be removed in the event of breakage. | The curtain wall utilizes a pressure plate which will facilitate any necessary glass replacement. The phenolic panels will not be set into the glazing pocket. | CLOSED | | The parameters are the same in terms of a rain screen wall system, however, the openings have been changed to a storefront system and a sealant-based tie in with the AVB. | | |
| D-5 | JRC | A-211/A212 | A number of elevations indicate phenolic panels with face brick panels on either or both sides. Consider how the connection is designed for maintaining the air barrier. | The AVB will always run continuous behind the systems. There will be no break or transiion in the AVB where the veneer material changes from brick to panel. | CLOSED | | Refer to 100% DD response – no change in response comment. | | |
| D-6 | JRC | A-211/A212 | Brick panels, suggest study on BEJ (Brick Expansion Joint) and position of random pattern brick joints as well as masonry openings and their associated lintel design. | Generally where the brick rises more than one story there will be a continuous relieving angle bracketed from the floor edge. Localized loose lintels will employed as necessary. | CLOSED | | Refer to 100% DD response – no change in response comment. | | |
| D-7 | JRC | A-213 | As the design continues - please consider the offset configuration of the sun shade framing indicated on several of the elevations. The curtainwall specified may not be able to achieve the offset positioning as have been indicated. Primary issue will be structural loading on the horizontal mullions as well as the potential interference with the specified weep designation for each glass panel. | It is anticipated that the horizontal will be structural in this configuraion. Openings are being adjusted accordingly. This will maintain the integrity of the separate panels to allow for zone drainage. The current design is under review by manufacturers. | CLOSED | | Sunshades have been deleted from the project and the curtain wall has been changed to storefront. | | |
| D-8 | JRC | A-214 | As the design continues - please consider the location of the horizontal masonry joint and its final location. Confirm that the expansion or contraction limits are maintained. | Refer to item 61. The only locations where veneer will bear directly from foundation to roof are at the auditorium and gymnasium. | CLOSED | | Refer to 100% DD response – no change in response comment. | | |
| D-9 | JRC | A-215 - A 217 | Please see comments noted above as similar | Refer to responses above. | CLOSED | | Refer to 100% DD response – no change in response comment. | | |
| D-10 | JRC | A-311-A-320 | The following comments apply generally to all wall sections. Please consider these as suggestions as the construction document phase continues. | Refer to responses above. | CLOSED | | Refer to 100% DD response – no change in response comment. | | |
| D-11 | JRC | A Series | Typical head and sill details at curtainwall - consider minimizing potential thermal bridging with structural slab. | Thermal bridging will be considered. | CLOSED | | Details have been modified for storefront framing at the openings. | | |
| D-12 | JRC | A Series | Typical head and sill details at curtainwall - consider the method of flashing and how potential movement may impact it. | Flashing and movement will be considered. As details develop JLA would be pleased to do a sit down review of BEx comments. | OPEN | | Refer to 100% DD response – no change in response comment. | | |
| D-13 | JRC | A Series | Typical brick details - the specifications call for special shapes. As the design continues note that the potential cost and detail consideration increases with the number of special shapes intended for the project. | Specials will be detialed as required to meet the design intent. | CLOSED | | | | |
| D-14 | JRC | A Series | Roof / parapet details - provide the masonry walls to expand, minimizing potential water infiltration | Details will be provided for review. | CLOSED | | | | |
| D-15 | JRC | A Series | Typical air barrier details - primarily at the intersection of differing materials. Allow for thermal expansion and movement. | Details will be provided for review. | OPEN | | Refer to 100% DD response – no change in response comment. | | |
| D-16 | JRC | A Series | Glazing at offset panels - Standard frames as specified may not achieve the required thermal barrier and subject the framing to condensation, sections 2 and 3 on sheet A318 | JLA to reivew. The intent here is not clear to the reviewer due to incomplete drafting. | CLOSED | | These wall sections have been modified with the deletion of the curtain wall. | | |
| D-17 | JRC | A Series | Exterior sun shade details - as they develop please consider the limitations on weight and wind loading that could contribute to the limits of the aluminum curtainwall system. In addition, the connections for the sun shades could impact thermal separation, (bridging), and failure of the air barrier cavity seals at the line of insulation. | JLA understands comment. | CLOSED | | Sunshades have been deleted from the project. | | |

| Item | Initials | Reference | 100% DD Comments | 100% DD Response | Action | 60% CD Comments | 60% CD Response | 90% CD Comment | 90% CD Response |
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| D-18 | JRC | A Series | Details for skylight will be reviewed with next package. Several items to consider are the thermal barrier between the framing and roof deck as well as the height of the skylight curb, primarily for winter snow depth and potential water infiltration. | Skylight detials are under development. A section at the curb will be provided for review by the commisioning agent. | CLOSED | | | | |
| D-19 | PW | A104 | | | CLOSED | As the design process continues, be sure proper drainage of all roof areas is provided including bays, projections, stairwells, etc. (ie, no drainage shown at the bay along the south elevation between S2 and S3.) | Small bays will direct drain off of the edge. Stair roofs will drain onto the main roof. | | |
| D-20 | PW | dwg 1/A314 | | | CLOSED | At the interface of the roof assembly and the exterior wall, be sure to provide continuity of the air barrier from the wall to the roof. Discontinuities of the air barrier provide pathways for air exfiltration and air infiltration and the large volumes of moisture vapor that travel in them. This moisture vapor can condense on cold surfaces creating moisture problems. | The roof vapor retarder and AVB will be overlapped and sealed along the roof edge. | | |
| D-21 | PW | | | | CLOSED | As brick and concrete masonry units are porous and absorb water, be sure to provide expansion joints vertically and horizontally to accommodate expansion/contraction due to moisture absorption. Frequency of expansion joints can be found in The Brick Industry Assocation and The International Masonry Institute. | Expansion joints will be provided at the top of the masonry walls and will also have multiple vertical control joints in the façade. CMU back up walls at gym and auditorium are restrained by bond beams and do not require expansion joints. | | |
| D-22 | PW | dwg 4/A322 | | | CLOSED | As the design proceeds, be sure to include proper drainage of the wall cavity at the cavity's bottom. | Proper drainage will be provided at the base of walls. | | |
| D-23 | PW | dwg 4/A322 | | | OPEN | Consider including ventilation openings in the mortar joints at the top of the typical wall cavity (for brick and concrete masonry unit walls) for enhanced ventilation and drying out of the wall cavity and exterior masonry cladding. This will also reduce the risk of inward driven moisture vapor | JLA will review – the top of the wall will have a brick expansion joint. This is typically open for good ventilation. | | |
| D-24 | PW | dwg 1,2/A316 | | | CLOSED | As the design progresses, be sure to seal the air barrier when penetrated by the canopy/sunshade structure. | The AVB will be sealed at all penetrations. | | |
| D-25 | PW | A501 | | | CLOSED | Confirm R-value project requirements can be met with continuous insulation within the wall cavity. (Confirm insulation is not needed within the typical stud cavity) | The insulation will be continuous and the energy model will meet code and project requirements. | | |
| D-26 | PW | dwg 10/A501 | | | OPEN | Due to the open joint configuration of the composite metal panel cladding, drainage of the wall cavity should be carefully considered. The horizontal configuration of the Z-furring supporting the composity metal panels will impede good drainage of the cavity. Consider orienting the Z-furring vertically if possible. | JLA will review. The Z furring is designed to drain at edges. | | |
| D-27 | PW | dwg 9/A501 | | | OPEN | Similar to comment on 10/A501 | JLA will review. The Z furring is designed to drain at edges. | | |
| D-28 | PW | dwg 2/A501 | | | CLOSED | We recommend a soft joint between the underside of the relieving angle and the brick/CMU below to allow for expansion due to moisture absorption. | This is an open joint that will allow for expansion of the masonry. | | |
| D-29 | PW | dwg 5/A540 | | | OPEN | Consider including an enlarged detail describing the flashing, counterflashing and roof flashing termination in greater detail. | JLA will review. | | |
| D-30 | PW | dwg 5/A540 | | | CLOSED | Will the skylights have gutters to capture condensation? | Yes. | | |
| D-31 | PW | dwg 1/A104 | | | OPEN | | | Consider providing an overflow roof drain near every roof drain to create a secondary means of drainage should the main become clogged from leaves, dirt, debris, etc. | |
| D-32 | PW | dwg 1/A104 | | | OPEN | | | Slopes of the roof membrane should be provided. Recommend a minimum of 1/4" per foot to allow for deflection the roof structure. | |
| D-33 | PW | dwg 1/A104 | | | OPEN | | | Along the south elevation there are several "bays" with low-slope membrane roofs separated from the main roof. It is not clear how these roof areas are being drained; with a scupper or with a roof drain? | |
| D-34 | PW | 07 54 19 | | | OPEN | | | Roofing insulation: a high compressive strength rigid insulation may be needed under the precast conc. pavers of Roof System 4. The polyiso foam board insulation currently in the spec has a capacity of 20 psi, which may not be sufficient. | |
| D-35 | PW | A213 | | | OPEN | | | As brick and concrete masonry units are porous and absorb water, be sure to provide expansion joints vertically and horizontally to accommodate expansion/contraction due to moisture absorption. Frequency of expansion joints can be found in The Brick Industry Assocation and The International Masonry Institute. | |

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| D-36 | PW | A501 | | | OPEN | | | As currently designed, the fluid applied AVB (07 27 26) is vapor impermeable and will function as a vapor barrier (water vapor permeance is currently specified to be 0.08 perms). These exterior wall systems should be designed to dry to the interior and exterior of the AVB. As the design is completed, Jacobs strongly recommends not including any interior finishes with a water vapor permeance of less than 2 perms as this would act as a second vapor barrier effectively trapping moisture vapor within. Vinyl wallcovering and some paint coatings are vapor impermeable and should be avoided. | |
| D-37 | PW | A501 | | | OPEN | | | Wall Types 4, 5, 6, 7, 8, 9: As the wall sections for these wall types are completed, consider including voids in the mortar joints at the top of the masonry cladding to allow for ventilation of the wall cavities. (Ventilation of the wall cavities will allow the water vapor to be circulated to the exterior via convection. Dryer wall cavities will reduce the risk of moisture damage within the exterior wall system in two ways; 1) mitigate the risk of inward driven moisture vapor drive in the spring and fall, and 2) reduce corrosion of the steel masonry anchors, fasteners, etc. | |
| D-38 | PW | 3, 12, 13, 17/A520 | | | OPEN | | | As these parapet details are finalized, Jacobs strongly recommends joining the air barrier of the roof assembly with the air barrier of the wall assembly. There should be no discontinuities of the air barrier, and the wall-roof interface is a common failure mode. (Small defects or gaps in the air barrier can result is substantial moisture problems within the wall/roof. For example, in the cold climate of Massachusetts, approximately 50 pints of water can enter a wall assembly through a hole only 1/2" in diameter during the course of a single heating season.) | |
| D-39 | PW | 10, 11/A521 | | | OPEN | | | We recommend a soft joint between the underside of the relieving angle and the brick/CMU cladding below to allow for expansion due to moisture absorption. | |
| D-40 | PW | 4,6/A521 | | | OPEN | | | Recommend including pan flashing with end dams below the aluminum sill to collect and drain to the exterior incidental water which will enter the window assembly as it ages. (Gaskets, seals, etc become brittle and inelastic over time and fail to expand/contract.) Pan flashing with an interior upturned leg is a best practice and will prevent moisture from entering the wall system. | |
| **Plumbing** | | | | | | | | | |
| D-41 | WGH | P0.02 | Schematic H.W. Heater / Storage Tank Piping Detail 1 includes a hot water return recirculation pump connected to the BMS for the potable domestic hot water system. Non-Potable Water Heater Piping Detail includes a hot water return recirculation pump controlled by a (7) programmable time clock. Is this recirc pump and time clock connected to the BMS? | Detail to be revised with circ pump connected to BMS. | CLOSED | This schmatic has been relocated to sheet P001. The control notes call for the water heater controller to interface with the BMS. DD response notes circ pump to connect to BMS. Please clarify. | The detail and specification revised to monitor the status of water heater and recirculating system through BMS | | |
| D-42 | WGH | P0.02 | Detail 7 calls for an oil minder control panel. Does this control panel integrate with the BMS? The specified unit includes this option. | Yes. Will connect panel to BMS. | OPEN | Sump detail appears removed from detail sheets. Is this still in scope? | Detail shown on dwg P003 | Elevator sump pump detail calls for panel to have additional contact for remote alarm location. Suggest specifying in notes if this alarm is to be monitored at BMS (and ATC contractor scope). | |
| D-43 | WGH | P0.02 | Detail 7 shows a single float switch. The specifications indicates a stainless steel probe. The specified unit includes additional floats and sensors. Cx suggest coordinating the detail and specifications. | Agree Will coordinate and update detail. | OPEN | Sump detail appears removed from detail sheets. Is this still in scope? | Detail shown on dwg P003 | Detail indciates float switch while specifications still call for stainless steel sensor probe. | |
| **Mechanical** | | | | | | | | | |
| D-44 | KML | General | Drawing set does not include a symbol/abbreviation legend. | Symbol/abbreviation legend is included on drawing M302. | CLOSED | CxA suggest alphabetizing the abbreviations list. | GGD: Will comply. | | |
| D-45 | KML | M Series | All terminal heating/cooling equipment locations not yet indicated. Several occupied spaces are not outfitted with ventilation or tempering. | Terminal equipment locations will be indicated. | CLOSED | Comment still OPEN. | GGD: This has been corrected on the 90% set. | | |
| D-46 | KML | M Series | Mechanical equipment nomenclature/tags not yet indicated. | Equipment tags/nomenclature will be indicated. | CLOSED | | | | |
| D-47 | KML | M101A | No exhaust indicated for Recycling/Trash Room 1014. | Exhaust will be indicated. | CLOSED | | | | |
| D-48 | KML | M101A | Kitchen makeup and exhaust air equipment and ductwork not indicated on mechanical floor plans. | Kitchen make up and exhaust equipment and ductwork will be indicated. | CLOSED | Comment still OPEN. | GGD: This has been corrected on the 90% set. | | |
| D-49 | KML | M101A | Enlarged Boiler Room Plan appears to indicate the boiler plant is not confined to the designated space (pumps and expansion tank shown in Custodian Toilet 1016. | Boiler room plan has been updated. | CLOSED | | | | |
| D-50 | KML | M101A-103D | Ductwork plans do not indicate supply/return designations. | Ductwork plans will indicate supply/return designations. | CLOSED | Comment still OPEN. | GGD: This has been corrected on the 90% set. | | |
| D-51 | KML | M101A-103D | Ductwork plans do not yet show duct routes and connections to all terminal units. | Duct routes and connections to all terminal units will be indicated. | CLOSED | Comment still OPEN. | GGD: This has been corrected on the 90% set. | | |
| D-52 | KML | M101A-103D | Ductwork plans do not indicate min/max airflow values utilized for basis of design and energy modeling. | Ductwork plans will indicate max design airflow values for equipment. The VAV schedule will indicate minimum airflow values. | CLOSED | | | | |
| D-53 | KML | M201A-203D | Mechanical piping plans do not indicate system or supply/return designations (CHWS/R, HHWS/R). | Piping plans will be updated to indicate suppy/return designations. | CLOSED | Heating Hot Water piping labels added in places. CxA suggest piping identification be clearly provided with flow arrows. | GGD: This has been corrected on the 90% set. | | |

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| D-54 | KML | M201A-203D | Mechanical piping plans do not yet show supply and return CHW/HW piping and connections to all terminal units. | Piping plans will be updated to indicate connections to terminal units. | OPEN | Comment still OPEN. | GGD: This has been corrected on the 90% set. | Piping plans do not show routes/connections to rooftop equipment. | |
| D-55 | KML | M201A-203D | Mechanical piping plans do not indicate min/max flow rates or differential pressures utilized for basis of design and energy modeling. | Hydronic flow rates of equipment will be indicated in future submissions on the piping plans and schedules. | OPEN | Comment still OPEN. | GGD: This will be finalized and addressed on final CD piping flow diagrams and hot & chilled water controls drawings. | | |
| D-56 | KML | M201A-203D | Mechanical piping plans do not include roof level and connections to Rooftop Air Handling Units equipped with chilled water and heating hot water coils. | Drawing M104 indicates both ductwork and piping layout at the roof level. | OPEN | | | Roof piping layout not indicated on Drawing M104 (ductwork only). | |
| D-57 | KML | M104 | | | OPEN | Sheet M104 includes the note "Factory fabricated rooftop plenum curbs to be provided by RTU manufacturer. Typical". This note is at variance with the Rooftop unit / Makeup air unit detail on sheet M304. Refer to comment D-63. Please coordinate these sheets. | GGD: Details will be revised for RTU curb requirements. | Please confirm if rooftop plenum curbs will be provided by RTU manufacturer or HVAC contractor. | |
| D-58 | KML | M104 | | | OPEN | Rooftop unit RTU-5/6 includes supply and return mains dropping into the building within a roof level duct enclosure. CxA suggest roof level duct enclosures be detailed for construction, duct access (if necessary), etc. | GGD: A detail will be provided. | Detail not included in 90% CD set. | |
| D-59 | KML | M104 | | | OPEN | Enlarged Pump House Plan is shown at 1/4" scale. CxA suggest this enlarged plan be increased for better clarity. | GGD: Will comply. | Still shown at 1/4" scale. | |
| D-60 | KML | M301 | RTU schedule notes call for variable frequency drives for energy recovery wheels. Specifications call for fixed plate heat exchangers or enthalpy plate heat exchangers for energy recovery. Please verify what type of energy recovery, if any, is required. | The basis of design rooftop units will be equipped with fixed plate heat exchangers. We will review and revise the RTU schedule notes. | OPEN | Comment still OPEN. | GGD: Schedule notes will be revised. | RTU schedule notes still include VFD for energy recovery wheel. | |
| D-61 | KML | M301 | Air-Cooled Liquid Chiller schedule notes call for 30% propylene glycol solution for heating hot water system freeze protection. Please verify if this note is applicable for the chilled water system or should be relocated. | Schedule note has been updated to indicate chilled water. | CLOSED | | | | |
| D-62 | KML | M301 | Equipment schedules in development. To be further reviewed once complete. | Equipment schedules will continue to develop. | OPEN | Comment still OPEN. | GGD: Schedules will continue to develop. | Equipment schedules are not complete, including but not limited to expansion tanks, glycol make-up systems, ductless splits, condensate pumps. | |
| D-63 | KML | M Series | Roof Top Unit Detail/Layout not included. To be reviewed once complete. | Make up air unit detail on drawing M304 will be updated to apply to all rooftop units. | CLOSED | This Rooftop unit / Makeup air unit detail is at variance with the drawing notes on sheet M104. Refer to comment D-57. | GGD: Detail will be revised for RTU curb requirements. | | |
| D-64 | KML | M Series | Control diagrams not provided for all equipment and systems. To be reviewed once complete. | Control diagrams will be provided in future submissions. | CLOSED | | | | |
| D-65 | KML | M Series | Because of the size of the building and the numerous systems, CxA suggest including single line flow diagrams for the mechanical systems including: heating hot water piping systems, chilled water piping systems, condensate piping, and air distribution systems. | Drawing M305 includes flow diagrams for ductwork, heating hot water and chilled water piping systems. | CLOSED | | | | |
| D-66 | KML | M401 | | | OPEN | | | RTU-1-4 are noted as 100% outdoor air units. The flow diagram indicates recirc dampers that the sequence of operation states shall modulate in sequence with the outdoor air and exhaust air dampers to maintain space CO2 and temperature. The schedule indicates the units are only capable of 12,500 CFM of outdoor air with a total supply airflow of 20,000 CFM. Please clarify. | |
| D-67 | KML | M401 | | | OPEN | | | RTU-1-4 points list includes reference to energy recovery wheel. Basis of design is for energy and sensible heat plate exchangers. | |
| D-68 | KML | M402 | | | OPEN | | | RTU-5 points list includes reference to energy recovery wheel. Basis of design is for energy and sensible heat plate exchangers. | |
| D-69 | KML | M402 | | | OPEN | | | RTU-5 serves the gymnasium. Sequence of operation states the chilled water coil control valve will modulate to dehumidify the incoming air. Consider specifying space relative humidity setpoints to control unit operation in order to protect gymnasium floor and avoid voiding warranty. | |
| D-70 | KML | M403 | | | OPEN | | | RTU-6 is noted as 100% outdoor air unit. The flow diagram indicates recirc dampers that the sequence of operation states shall modulate in sequence with the outdoor air and exhaust air dampers to maintain space CO2 and temperature. The schedule indicates the units are only capable of 11,250 CFM of outdoor air with a total supply airflow of 12,000 CFM. Please clarify. | |
| D-71 | KML | M403 | | | OPEN | | | RTU-6 points list includes reference to energy recovery wheel. Basis of design is for energy and sensible heat plate exchangers. | |
| D-72 | KML | M404 | | | OPEN | | | RTU-6 points list includes reference to energy recovery wheel. Basis of design is for energy and sensible heat plate exchangers. | |
| D-73 | KML | M405 | | | OPEN | | | The VAV details show a connection to the lighting controls and associated motion sensor. Please clarify if the lighting controls motion sensor shall be used to index the VAV between occupied and unoccupied modes. | |
| D-74 | KML | M406 | | | OPEN | | | Boiler sequence of operation reference rotating boilers #1, 2 and 3. There are only 2 boilers indicated in the schedule. | |

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| D-75 | KML | M407 | | | OPEN | | | Chilled water system sequence of operation reference primary and secondary loop pumps. System appears to be variable primary with a single set of chilled water pumps. Please clarify. | |
| **Electrical** | | | | | | | | | |
| D-76 | JAH | E001 | Suggest modifying "Electrical Symbols " with respect to raceways and panels data - a similar symbol is used for both. | Ok | OPEN | Comment still OPEN. | GGD: the symbol is not the same it is a printing issue that we will correct. | | |
| D-77 | JAH | E-PH-1 | Drawing is not listed on drawing table of contents. In addition, if drawing is to be utilized with or is to complement drawing E003-1, there should be a note or reference between the two. | This is an early bid package not to be issued with final set. | CLOSED | Please clarify how dwg will be issued | GGD: the work is done and it will not be part of the final bid set. | | |
| D-78 | JAH | E-PH-1 & E002 | Drawing E-PH-1 lists two fixtures that do not appear on the lighting fixture drawing (E002) - namely, SL1A & SL2. If these fixture types are correct, and all lighting fixture info is to be found on E002, these fixtures should be added to drawing E002. If incorrect, remove/correct the fixtures on drawing E-PH-1. | E-PH-1 is an early bid package not to be issued with the final set. | CLOSED | Please clarify how dwg will be issued | GGD: the work is done and it will not be part of the final bid set. | | |
| D-79 | JAH | E-PH-1 | Add circuit info for the lights as design is finalized | This has been completed. | CLOSE | | | | |
| D-80 | JAH | E002 | Complete lighting fixture table . Of the dozen or so fixtures utilized on the lighting drawings, the "mgr. column" (2nd from right) and the "schedule column" (farthest right column) do not contain all required references. Also, for many fixtures, a single alpha character is designated for a manufacturer, however, this is at variance with the fixture manufacturer chart. | This will be completed as the drawings develop. | OPEN | To be verified as design progresses | GGD: This will be completed as the drawings develop. | Schedule data not complete. | |
| D-81 | JAH | E002 | The drawing indicates lighting fixture schedule notes. However, they appear to be a mixed set - some Notes are applicable for ALL fixtures yet some are only applicable to just a few fixtures. Please clarify general from specific notes or ADD notes that apply to all utilized fixtures in the appropriate fixture schedule column. | This will be completed as the drawings develop. | OPEN | To be verified as design progresses | GGD: This will be completed as the drawings develop. | Schedule notes still unclear as to what notes apply. | |
| D-82 | JAH | E002 | Drawing title & contents focus on lighting and lighting fixtures. It is recommended that the ELECTRICAL GENERAL NOTES be moved to a separate drawing. | Ok | OPEN | Comment still OPEN. | GGD: we will move the electrical general notes to the symbol list | Electrical general notes still included with lighting schedules and notes. | |
| D-83 | JAH | E003-1 | Add circuit info for the lights as design is finalized | Ok | CLOSED | To be verified as design progresses | GGD: this will be completed as the drawings develop | | |
| D-84 | JAH | E003-2 | Add circuit info for the lights as design is finalized | Ok | CLOSED | To be verified as design progresses | GGD: this will be completed as the drawings develop | | |
| D-85 | JAH | E002-E005 (typ) | Suggest removing north arrow from non-plan drawings | Will remove. | CLOSED | | | | |
| D-86 | JAH | E101A (typical for all power and lighting plan drawings) | Instead of just showing a north arrow, it is suggested to show a keyplan for these drawings (would apply to mechanical and plumbing drawings, as well). | Ok | CLOSED | | | | |
| D-87 | JAH | E101A (typical for all power and lighting plan drawings) | Add circuit info for all equipment/lights as design progresses. | Ok | CLOSED | To be verified as design progresses | GGD: this will be completed as the drawings develop | | |
| D-88 | JAH | E201A (typical for all power plan drawings) | Identify all components | Ok | CLOSED | | | | |
| D-89 | JAH | E204ABCD | Note 1 indicates a lightning protection system is shown but drawing does not provide this. Review and reconcile. | We will revise to what will be a lightning preventor system. | OPEN | Please clarify what is provided for a Lightning Preventor System - UL master label only refers to Ltng Protection sys. | GGD: Lighting preventor system manufactuerer provides upon completion of installation and required inspection and tests that the system meets HPB-21, Levels 1&2 a certificate of Guarantee catastrophe umbrella policy that guarauntees the preventor lighting protection system with an insurance policy of $10,000,000.00. The guarantee is limited to the structural building and also excludes surge transient protection for services. | Reconcile "Lightning Preventor" and "Lightning Protection" nomenclature as required. | |
| D-90 | JAH | E300 | Suggest indicating code/manufacturer clearance for electrical equipment on drawing. | Will add to the drawings. | OPEN | To be verified as design progresses | GGD: we will add to the drawings. | Several clearances not indicated. | |
| D-91 | JAH | E301 | ATS-OC connection to panel EHP3C is not indicated at ATS end. Please add info. | Will correct. | CLOSED | Comment still OPEN. | GGD: EPH3C is fed from EHP1A | | |
| D-92 | JAH | E301 | Load Bank not indicated at generator. Please add info. | Ok | CLOSED | Comment still OPEN. | GGD: Generator is natural gas therefore no load bank will be provided. | | |
| D-93 | JAH | E301 | MSB connections to panels LP3C, MHP3C, LP3B and at transformers for panels MP3B and MP3C are not indicated at MSB end. Please add info. | Ok | CLOSED | Comment still OPEN. | GGD: LP3C is fed from 4DP1C, MHP3C is fed from 4DP1C, LP3B is fed from 4DP1B, MP3B and MP3C are fed from 120/208V distribution panels. | | |
| D-94 | JAH | E301 | There is an emergency LS panel installed on floors 1 and 2 - suggest adding a similar panel at floor 2 | Will review to see if this is needed. | CLOSED | To be verified as design progresses | GGD: not needed. | | |
| D-95 | JAH | E301 and E302 | Panel schedule lists panel 4DP1B - Riser does not. Add panel to riser or remove from schedule? Please reconcile. | Will correct. | CLOSED | | | | |
| D-96 | JAH | E301 and E302 | Verify Main switchboard ID - MSB or MSB-1 ? | MSB, this will be corrected. | CLOSED | Comment still OPEN. | GGD: MSB1A | | |
| D-97 | JAH | E302 + | Need to add several more panel schedules to detail all the panels shown on riser (add add'l drawings, as required). | Will be added as the drawings progress. | OPEN | To be verified as design progresses | GGD: this will be completed as the drawings develop | Incomplete. | |
| D-98 | JAH | E302+ | Complete panel schedules with circuit numbers, AIC rating, and MLO/MCB indication (add add'l drawings, as required). | Will be completed as the drawings progress. | OPEN | To be verified as design progresses | GGD: this will be completed as the drawings develop | Incomplete. | |
| D-99 | JAH | E304 | Det. 12: Please verify is AHJ requires generator to have local EPO | This is a code requirement, we will review with AHJ. | CLOSED | To be verified as design progresses | GGD: this is a code requirement | | |
| D-100 | JAH | E304 | Det. 12: Provide connection detail to load bank at generator | Will add to the drawings. | CLOSED | No change for 60%CD set. | GGD: no load bank | | |
| D-101 | JAH | E305 | Suggest Automated Lighting Control one-line be presented on a separate drawing for clarity and ease of review | Ok | CLOSED | To be verified as design progresses | GGD: done it is on E306 | | |
| D-102 | JAH | E400 | Suggest Smoke Seq of OPs and fire alarm matrix be moved to a separate drawing for clarity and ease of review | Ok | OPEN | To be verified as design progresses | GGD: suggestion considered. | | |
| D-103 | JAH | E401A (typical for all FA plan drawings) | Instead of just showing a north arrow, it is suggested to show a keyplan for these drawings (would apply to mechanical and plumbing drawings, as well). | Ok | CLOSED | | | | |

### 2.1.3 MSBA CD-60% Review and District Response

The OPM has reviewed the District's response to the MSBA 60% Construction Documents Comments and confirms that the comments have been addressed with the 90% Construction Documents submission.

The District's response to the MSBA 60% Construction Documents Comments is appended to the end of this section.

**City of Framingham**
**Fuller Middle School**
**60% CD**
**MSBA Review Comment Responses**
**9/13/19**

# APPENDIX 6B
# MODULE 6 – 60% CONSTRUCTION DOCUMENTS REVIEW COMMENTS

**District:** City of Framingham
**School:** Fuller Middle School
**Owner's Project Manager:** Symmes Maini Mckee Associates
**Designer Firm:** Jonathan Levi Architects
**Submittal Received Date**: August 9, 2019
**Review Date**: August 13-29, 2019
**Reviewed by**: Gienapp Architects, K. Brown, K. Sullivan, R. Hudson

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## MSBA REVIEW COMMENTS

The following comments[1] on the 60% construction documents submittal are issued pursuant to a review of the project submittal document for the new construction of the proposed project and presented as a 60% construction documents submission in accordance with the MSBA Module 6 Guidelines.

### 6B.1 Summary Comments

- Basic Project Information:
  - *630 students*
  - *137,100 GSF*
  - *New construction*
  - *Construction Manager at Risk: Consigli Construction*
- Comments here:

[1] The written comments provided by the MSBA are solely for purposes of determining whether the submittal documents, analysis process, proposed planning concept and any other design documents submitted for MSBA review appear consistent with the MSBA's guidelines and requirements, and are not for the purpose of determining whether the proposed design and its process may meet any legal requirements imposed by federal, state or local law, including, but not limited to, zoning ordinances and by-laws, environmental regulations, building codes, sanitary codes, safety codes and public procurement laws or for the purpose of determining whether the proposed design and process meet any applicable professional standard of care or any other standard of care. Project designers are obligated to implement detailed planning and technical review procedures to effect coordination of design criteria, buildability, and technical adequacy of project concepts. Each city, town and regional school district shall be solely responsible for ensuring that its project development concepts comply with all applicable provisions of federal, state, and local law. The MSBA recommends that each city, town and regional school district have its legal counsel review its development process and subsequent bid documents to ensure that it is in compliance with all provisions of federal, state and local law, prior to bidding. The MSBA shall not be responsible for any legal fees or costs of any kind that may be incurred by a city, town or regional school district in relation to MSBA requirements or the preparation and review of the project's planning process or plans and specifications.

- *The Total Project Budget per the PFA is $98,276,878, and the information provided confirms it is still on budget.*
- *The construction cost estimates are $77,752,185 (CMR's estimate by Consigli Construction Co.), $77,544,171 (Designer's estimate by A.M. Fogarty) and $77,247,346 (OPM's estimate by Miyakoda Consulting).*
- *The construction budget per the PFA is $77,935,429, and the information provided confirms that the reconciled construction cost of $77,752,185 is still within budget.*
- *While some items of work (i.e. joints in the floor tile) are well beyond 60% CD development, other core building issues (i.e. wall sections, details) appear to be behind. With the response to these comments, indicate if this is intentional, and if so, provide an explanation for why.*

Response: The items JLA has developed beyond 60% CD development typically fall into 2 categories: Those for which we have submitted early 100% construction packages (i.e. sitework, structure and concrete) and those in which the District has a particular interest in regard to appearance and/or maintenance. It is JLA's intent to have other core building issues to be at not less than 60% CD level, and believe this is reflected in the documents. JLA's approach to notating wall sections and details is to refer to typical wall and window types so as to not duplicate notes and dimensions which may be modified over time. As a result, for example, many of the 76 wall sections included have more information than may appear upon initial inspection.

**6B.2 OPM Deliverables:** *Unless specifically stated otherwise, the OPM deliverables are included in the submission with no response from MSBA required.*

**6B.2.1 Submittal Review & Coordination**

- Review designer submissions; make recommendations to Owner. Address each of the following items individually, and describe how each was evaluated.
  - *Approve submission.*
- Coordinate design; include written recommendations to the Owner.
  - Technical accuracy, coordination & clarity.
  - Efficiency & cost effectiveness.
  - Operability.
  - Constructability.
  - Phasing.
  - Bid-ability.
  - Site access during construction.
- Coordinate the commissioning consultant's review.
  - Include Cx review & District response.
  - Incorporate Cx recommendations.
- Coordinate the District response to MSBA comments of previous submittal.
  - Include MSBA review & District response.

- Comments addressed / comment resolution outstanding.

**6B.2.2 Project Schedule:** All schedules should be presented in calendar days.

Update project schedule: As a minimum, the schedule update should provide the same level of detail as was included in Exhibit C of the Project Funding Agreement, expanded and updated to include milestones for Design Development, Bidding, Construction, and Closeout. The updated schedule should include proposed critical path and construction milestone information. In addition to the construction milestones, the schedule must also include the following information as listed in MSBA Module 7, Schedule Activities:

- Punch list start and end dates.
- Date of Project Registration with the US Green Building Council ("USGBC") or Collaboration for High Performance Schools ("CHPS").
- Provisional/Design package submittal date to USGBC or CHPS.
- Submittal date of 50% DCAMM Notification and 100% DCAMM Notification.
- General Contractor/Construction Manager request for final payment.
- Commissioning Consultant inspection (substantial completion plus approximately 10 months).
- Submittal date of Final Commissioning Report to MSBA.
- Submittal date of Final Construction package including but not limited to Final Commissioning Report to USGBC or CHPS.
- Anticipated issuance date of final Green School Program Certification letter from USGBC or CHPS.
- Submittal date to MSBA of Commissioning Certificate of Completion.
- Submittal date to MSBA of final reimbursement request.
- Indicate submission dates for the following approvals. In addition, provide dates for any other state or federal approval not listed below (the following list is not a comprehensive itemization of required state approvals; other requirements may apply, and some of the items listed below may not be applicable to this project). Indicate "Not Applicable" where appropriate: *The items listed below are not addressed or included in main project schedule, but they are listed in a separate sheet. These items should be added to the main project schedule for clarity (provide a revised project schedule in the response to this review).*

Response: Please see updated project schedule attached. (Attachment 6B.2.2.1)

- DESE - Special Education approval by Department of Elementary and Secondary Education.
- MHC – Project Notification Form and approvals by MA Historical Commission.
- OIG - Construction Manager at Risk approval by the Office of Inspector General.
- Executive Office of Energy and Environmental Affairs / EEA:
  - MEPA - MA Environmental Policy Act by Energy & Environmental Affairs:

        - ENF - Environmental Notification Form.
        - EIR - Environmental Impact Report.
      - Article 97 Land Disposition Policy approval by Energy & Environmental Affairs.
    - MA DEP - Massachusetts Department of Environmental Protection.
    - MA DOT - Massachusetts Department of Transportation. *The submission indicates this as not applicable.*
    - MA DPH - Massachusetts Department of Public Health. *The submission indicates this as not applicable.*
    - EPA –NPDES National Pollutant Discharge Elimination System Notice of Intent approval by the US Environmental Protection Agency.
    - MAAB - Accessibility variances by MA Architectural Access Board. *The submission indicates this as not applicable.*
- Indicate all required state reviews or permits on the milestone schedule including actual or planned dates of approval which are required in order to maintain the planned bidding and construction schedule and milestones indicated therein. For required state reviews or permit approvals which have not been obtained on schedule, provide a separate (sub network) schedule depicting recovery actions to obtain required approvals in order to maintain the bidding and construction schedule.
- A letter on District letterhead confirming that the Project has undergone review and obtained all necessary state reviews and approvals by any departments or agencies of the Commonwealth required by law to review the Project, including but not limited to the approvals listed above. Attach such letter of documentation evidencing such state reviews and approvals: *The submission does not contain a letter from the School District confirming the Project's status overall. Confirm this will be provided in the next submission.*

Response: Please see letter from District attached. (Attachment 6B.2.2.2)

- Identify any state reviews or permits for which approval has not been obtained as of the 60% Construction Documents submission date, and include in the District letter a status update including actions taken to date and actions planned to obtain the required approval(s) in order to comply with Project Funding Agreement (the "PFA") Section 4.12. and maintain the projected schedule milestones listed in OPM Deliverables.
- Section 4.12 of the PFA, executed between the District and the MSBA, requires that each project successfully undergo review and obtain all necessary approvals "prior to the solicitation of construction bids, by any departments or agencies of the Commonwealth required by law to review such projects..." As part of the response to these 60% CD submission review comments, MSBA requires documentation

that the District is in compliance with this requirement of the PFA.

- The schedule is to be updated and submitted to MSBA as often as is required to reflect any changes, including any changes to milestone dates, but must be submitted with each design submittal (DD, 60% CD, 90% CD).
- Indicate the date for submission to MSBA of the 60% and proposed dates for 90% Construction Documents submittals. The schedule is to incorporate 21 calendar day required duration for MSBA review of each submission, and a minimum of 14 calendar days for project team incorporation of MSBA review comments as well as all others into the project documents prior to the due date of the next submission or finalizing project documents for bidding. 35 calendar days for each submission is the minimum acceptable duration; if the project team believes additional time is required for any or all of the submissions the durations for these activities are to be increased accordingly.

### 6B.2.3 Scope and Budget

- Update project scope and budget:
  - Reconciled construction cost estimate including Designer/OPM comparison chart:
    - Prepare independent construction cost estimates pursuant to Section 8.1.2.2 of the Contract for Project Management Services, with escalation to the mid-point of construction, for comparison with the Designer's cost estimate, based upon design development progress documents.
  - CMR (if applicable):
    - If Owner has not yet contracted with a Construction Manager (CM), the OPM must develop a construction cost estimate for comparison with the Designer's cost estimate.
    - If the Owner has given the CM a Notice to Proceed, the OPM must review cost estimates provided by the Designer and CM and provide a detailed line by line reconciliation of the Designer's and CM's construction cost estimates.
  - Updated project budget in the total project budget format, based on the reconciled construction cost estimate. If the reconciled estimate is not used for the updated project budget, provide an explanation.
  - Value Engineering recommendations.
    - For any Value Engineering recommendations which have been accepted, provide a copy of the Committee vote.

**6B.3 Designer Deliverables:** *Unless specifically stated otherwise, the Designer deliverables are included in the submission with no response from MSBA required.*

### 6B.3.1 General Requirements

- Submit updated work plan.
- Updated and expanded Basis of Design narrative description for all disciplines.
- Updated building code analysis.
- Provide a list identifying all proposed proprietary items (if any) with an affidavit which shall indicate that an elected body of the district (school committee, city or town council, or selectmen, -but not ad-hoc building committee) has been presented with proposals for proprietary requirements approval action, has had an opportunity to investigate, or to require staff or consultant investigation upon each item so proposed, and has majority voted in an open public session that it is in the public interest to do so. Provide MSBA with a certified copy of the vote of the elected body. *The submission provides a list and the minutes of the Town Meeting wherein the items were approved; however, it does not appear to be an official certified copy of the vote. This should be reviewed and provided with the next submission.*

Response: Agreed. To be provided in the next submission

- Updated interior color theory statement describing proposed paint and material selections and colors for typical and special spaces, why they have been selected and how these selections relate to exterior materials and colors. Confirm that color and material selections have been presented to and approved by the District. *Included, the range of color choices and materials have been approved by the School Building Committee. However, the finalization of color values by the Committee is set to be concluded during construction. Confirm that any future color and/or materials selection will not affect the materials and colors included in the cost estimates.*

Response: Confirmed

- Updated structural narrative including methods of lateral bracing and how requirements of earthquake code will be met.
- Updated structural calculations and required floor loads.
- Independent structural design review in compliance with the current edition of The Massachusetts State Building Code (an MSBA requirement for all projects with new construction over 10,000 sf). MSBA requires submission of a structural engineering peer review as part of the Final (100%) Construction Documents submission, to include documentation of resolution of any issues identified by the Peer Reviewer. Actions are to be advanced well prior to the 90% CD submission to engage the peer reviewer, and that scheduling be arranged to allow final structural design drawings and calculations to be submitted to the peer reviewer at the time of completion of the 90% Construction Documents submittal, in order to incorporate comments and response action reporting in the final construction documents and avoid delays. Confirm this process has been initiated.
- Updated energy calculations. *Not included, please include in next submission.*

Response: Agreed. To be provided in the next submission

- Updated Life Cycle cost analysis for energy and water consuming devices. *The Life Cycle Cost Analysis is included for water consuming devices, but not for energy consuming devices. Please include in next submission.*

Response: Agreed. To be provided in the next submission.

- Updated heat gain and loss calculations for Heating, Ventilating and Air Conditioning systems. *The submission indicates these calculations are included with the Basis-of-Design Narrative; however, they do not appear to be included. This should be reviewed and provided in the next submission.*

Response: Agreed. To be provided in the next submission.

- Updated calculations showing total electrical load. *Calculations are included for generator sizing, but it does not appear to be complete. For example, it contains line items for life safety lighting and shelter lighting, but not other lighting. Confirm this will be reviewed and complete updated calculations provided in the next submission.*

  Response: Please see attached. (Attachment 6B.3.1)

- Updated security and visual access requirements:
  - Confirmation that the persons responsible for implementation of the District's emergency procedures, and responding emergency medical, fire protection, and police agency representatives have been consulted in the planning process and any associated requirements have been included in the project. *No reference is made to emergency medical responders being consulted. Please clarify in next submission.*

    Response: To be clarified in the next submission.

  - Identification of any other security related items particular to the District and/or the proposed project.
  - Verification that the following safety and security related issues have been reviewed and are in accordance with the District's procedures as noted above:
    - Main entrance design – describe District protocol for visitor entry and check-in related to the current design for visitors to remain in the vestibule versus a side sub-vestibule.
    - Classroom lockset hardware - confirm hardware functions are compatible with the District's protocols related to lockdown.
    - Classroom / Instructional spaces visibility - confirm that the inclusion of sidelights at entrance locations is compatible with the District's current standards related to visibility from corridors and whether any related vision control option measures are to be incorporated.
    - Alternative entry locations - confirm project includes site and building signage, as may be required by District's emergency

procedures, to identify locations where first responders may more directly reach a person needing medical attention; Knox Boxes; and provisions for building plans to be delivered to local fire and response agencies.

- Updated quality Control documents demonstrating:
  - Ceiling clearances.
  - Mechanical room and shaft sizes.
  - Coordinate specifications and drawings.
  - Filed sub-bid work.
  - Scheduling.
  - Equipment and power.
  - Existing and new construction.
  - Phasing.

### 6B.3.2 Space Summary

- Updated space summary and signed certification that reflects the current design. *Based on the space summary provided, the MSBA notes the following:*

| Spaces | PFA Space Summary | DD Space Summary | 60% CD Space Summary | 90% CD Space Summary | Difference to PFA | Comments |
|---|---|---|---|---|---|---|
| Core Academic Spaces | 36,000 | 35,600 | 35,530 | | (470) | This category has decreased by 70 nsf since the last submittal. |
| Special Education | 9,150 | 9,075 | 9,150 | | - | This category has increased by 75 nsf since the last submittal and is now in compliance with the original DESE approval dated September 27, 2018. |
| Art and Music | 3,675 | 3,640 | 3,640 | | (35) | This category remains unchanged since the last submittal. |
| Vocations & Technology | 3,170 | 3,185 | 3,150 | | (20) | This category has decreased by 35 nsf since the last submittal. |
| Health and Physical Education | 9,985 | 9,795 | 9,765 | | (220) | This category has decreased by 30 nsf since the last submittal. |
| Media Center | 6,280 | 6,250 | 6,250 | | (30) | This category remains unchanged since the last submittal. |

| | | | | | | |
|---|---|---|---|---|---|---|
| Dining and Food Service | 8,960 | 8,690 | 8,840 | | (120) | This category has increased by 150 nsf since the last submittal. |
| Medical | 610 | 620 | 620 | | 10 | This category remains unchanged since the last submittal. |
| Administration and Guidance | 5,250 | 5,245 | 5,235 | | (15) | This category has decreased by 10 nsf since the last submittal. |
| Custodial and Maintenance | 2,140 | 2,630 | 2,555 | | 415 | This category has decreased by 75 nsf since the last submittal. |
| Other | 6,700 | 6,755 | 6,630 | | (70) | This category has decreased by 125 nsf since the last submittal. |
| **Total Building Net** | **91,920** | **91,485** | **91,365** | - | (555) | **This category has decreased by 120 nsf since the last submittal.** |
| **Non Programmed** | | | | | | |
| Other Occupied Rooms | | | | | | |
| Unoccupied MEP/FP | 1,685 | 1,415 | 1,400 | | | |
| Unoccupied Closets, Supply Rooms & Storage | 235 | 280 | 350 | | | |
| Toilet Rooms | 3,560 | 3,325 | 2,970 | | | |
| Circulation | 34,175 | 25,970 | 26,350 | | | |
| Remaining | 5,215 | 14,285 | 14,665 | | | |
| **Total Gross** | **136,790** | **136,760** | **137,100** | | **310** | |
| **Grossing Factor** | **1.49** | **1.49** | **1.50** | | **0** | |

- Comparison of the current design with the final educational program, and confirmation that there are no variations. If there are variations, the written summary must address the following:
  - Explanation of deviations within the space summary from the Project Funding Agreement.

  - *The MSBA will continue to monitor these ineligible square footage amounts through Module 6, and to continue to consider them ineligible at PFA Bid. Please note the following:*

    - *The Medical category did not exceed guidelines at the time of PFA (610 nsf); however as outlined above, as part of the 60% submission the category has increased by 10 nsf, therefore 10 nsf would now be considered ineligible for reimbursement.*

Response: So noted.

- *Custodial and Maintenance exceeded guidelines by 35 nsf at PFA, and 35 nsf was considered ineligibile. This category has increased by 415 nsf in the 60% submission. This additional area will be considered ineligible.*

Response: So noted.

- *Please note that an additional elevator was added to the building following Schematic Design. As a result, the gross square footage has increased by 310 sf and the grossing factor has increased from 1.49 to 1.50. Any additional gross square footage added to the original PFA approved gross square footage will be deemed ineligible by the MSBA at the PFA Bid Amendment.*

Response: It is understood that any additional gross square footage added to the original PFA approved gross square footage will be deemed ineligible by the MSBA at the PFA Bid Amendment. It should be noted that an additional elevator has not been added following Schematic Design.

- The MSBA considers that deviations include changes in the size of a specific space, the total nsf of a program area (e.g. general classrooms, voc tech, dining etc.), the location of a space, the surrounding adjacencies of a space and or the intended purpose of the room.
- The submittal must clearly call out deviations to location and surrounding adjacencies through the use of redlines or "clouding."
- The explanation should clearly identify the basis of the change identifying both architectural and/or programmatic reasons.
- If the basis of the change is programmatic, the submittal should include a red-lined version of the educational plan included in the Project Funding Agreement.
- Regarding DESE approved SPED spaces:
    - If the District wishes to submit a change to its DESE approved submittal, it must a) confirm that all changes to SPED spaces are final; b) provide a new submittal utilizing the format of the original submittal requirements and clearly noting any changes through use of clouded floor plans and red-lined narratives and tables; and c) indicate how the project schedule can accommodate a potential resubmittal and approval by DESE. Please provide a separate package for changes to DESE approved SPED spaces. *The submission indicates that the proposed SPED spaces have been brought back into the configuration approved by DESE following the PS&B submittal. As part of the response to these review comments, confirm no further changes to SPED spaces will be considered.*

Response: Confirmed. No further changes to SPED spaces will be considered.

- If the District chooses not to change from the DESE approved submittal it should confirm that the spaces are the same or explain when and how the spaces will be returned to the approved size, configuration and location.

- Regarding DESE approved Public Day Education spaces; *Not applicable.*
- Regarding DESE pre-approved Chapter 74 Program spaces; *Not applicable.*

### 6B.3.3 Project Approvals

- Describe the status of the following approvals. In addition, provide the status of any other state or federal approval not listed below (the following list is not a comprehensive itemization of required state approvals; other requirements may apply, and some of the items listed below may not be applicable to this project). Provide a copy of the appropriate application forms and/or approval letters where applicable. Indicate "Not Applicable" where appropriate. For each agency approval required for this project, indicate the date when approval was received. All required approvals should have an associated approval date indicated as part of the 90% CD submission and prior to advertising for bids.
  - DESE - Special Education approval by Department of Elementary and Secondary Education.
  - MHC – Project Notification Form and approvals by MA Historical Commission.
  - OIG - Construction Manager at Risk approval by the Office of Inspector General.
  - Executive Office of Energy and Environmental Affairs / EEA:
    - MEPA - MA Environmental Policy Act by Energy & Environmental Affairs:
      - ENF - Environmental Notification Form.
      - EIR - Environmental Impact Report.
    - Article 97 Land Disposition Policy approval by Energy & Environmental Affairs.
  - MA DEP - Massachusetts Department of Environmental Protection. *The submission indicates that approval is currently pending. In the response to this review, indicate the date when approval is anticipated. As noted above, all required approvals should have an associated approval date indicated as part of the 90% CD submission and prior to advertising for bids. Provide a status update including actions taken to date and actions planned to obtain the required state reviews and permit approval(s) in order to comply with PFA Section 4.12 and maintain the projected schedule milestones listed in OPM Deliverables.*

DEP-related work is limited to reportable conditions associated with the precharacterization of soil to be removed from the site (as part of the site enabling package currently in construction). Initial release notification was filed with the DEP and a Release Abatement Measure (RAM) Plan was also filed, as required, with DEP prior to commencement of remedial excavation as part ongoing work. No other DEP approvals are currently required to perform or complete this work. If additional reportable soil conditions are discovered during performance of the work, appropriate DEP notifications will be made, but in no case is anticipated to adversely affect the overall schedule. Upon completion of the excavation and assessment work, a Permanent Solution Statement will be filed with the DEP closing out the release condition.

  - MA DOT - Massachusetts Department of Transportation. *The submission indicates this as not applicable.*
  - MA DPH - Massachusetts Department of Public Health. *The submission indicates this as not applicable.*
  - EPA –NPDES National Pollutant Discharge Elimination System Notice of Intent approval by the US Environmental Protection Agency.
  - MAAB - Accessibility variances by MA Architectural Access Board. *The submission indicates this as not applicable.*
- Confirmation that the Project has undergone review and obtained all necessary approvals by any departments or agencies of the Commonwealth required by law to review the Project, including but not limited to the approvals listed above. Attach such letter of documentation evidencing such reviews and approvals. In accordance with Section 4.12 of the Project Funding Agreement (the "PFA"), the District must obtain such reviews or approvals prior to the solicitation of construction bids.
- For any required state reviews or permits for which approval has not been obtained as of the 60% Construction Documents submission date, provide a status update including actions taken to date and actions planned to obtain the required state reviews and permit approval(s) in order to comply with PFA Section 4.12 and maintain the projected schedule milestones listed in OPM Deliverables.
- List and target dates for all local zoning approvals, testing and permits.
- Provide a certification that all applicable utility officials have been contacted by the designer regarding each basic design, and utility connections.

### 6B.3.4 Cost Estimate

- Provide a construction cost estimate based on the 60% Construction Documents, including cost estimates for general conditions, overhead and profit, insurance, bonds, and all other items; and allowances expressed as percentage rates for construction contingencies and escalation to the mid-point of the construction period; and other mutually agreed upon contingencies. Prepare the construction cost estimate in the CSI MasterSpec format to Level 3 and M.G.L. c.149, §44F (filed sub-bid) format including a

single line outline specification description for each item with the detailed unit rate or item cost buildup provided as a backup in each case.

- The date of the estimate should be no earlier than the date of 60% Construction Documents.
- Provide a summary sheet including the following:
  - Date that the estimate was prepared (value date).
  - Anticipated bid date. *Not included and should be included in the next submission.*

Response: Acknowledged and agreed. To be provided in the next submission.

  - Project and contract number. *The project name is included in the summary, but the contract number is not. This should be included in the next submission.*

Response: Acknowledged and agreed. To be provided in the next submission.

  - Title and location of the project.
  - Name of the Designer.
  - Name of the Estimator.
  - Site cost (including all utilities).
  - Building cost (including fixed equipment).
  - Estimated construction cost of each Phase of the work, totaled. *Not included and should be included in the next submission.*

Response: Acknowledged and agreed. To be provided in the next submission.

  - Costs of Item 1 and Item 2 work, as distinguished in the General Contractor's bid forms, individually totaled. *Not included and should be included in the next submission.*

Response: Acknowledged and agreed. To be provided in the next submission.

**6B.3.5 Drawings** (developed to 60% CD progress level)

- Cover sheet showing a list of all drawings, symbols, abbreviations, notes, locations map (the project title should be visible when the drawings are rolled). *Neither the drawing list, symbols, nor abbreviations are included on the cover sheet; however, it appears this information is included elsewhere in the set. Please confirm as part of the response to these review comments.*

Response: Confirmed. This information is included elsewhere in the set and noted in the drawing list directly after the cover page.

- Site drawings showing the following: *The submission did not include site drawings, which may be part of an early bid package. Therefore, compliance for the following items could not be confirmed. Consider providing these in the next submission for clarity.*

Response: Agreed. Site drawings from the early bid package currently under construction will be provided for reference in the next submission.

- Layout and location of all proposed work with details.
- Existing and proposed contours including floor elevations at all entrances/exits showing drainage away from the building.
- Bench marks and boring locations.
- Landscaping and planting.
- All utility service lines, systems and structures for electricity, gas, oil, water, steam, telephone, CATV, fire alarm, sanitary and storm drainage.
- Contract limit line and storage area for construction materials.
- Site survey which includes, but is not limited to, all existing foundations, obstructions and other physical characteristics of the site.

- Demolition drawings and temporary work required. *There are no demolition drawings included in the submission. This was noted in the previous review, and the District indicated they would be included. This should be reviewed and as part of the response to these review comments confirm this will be provided in the next submission.*

Response: Agreed. Drawings of the existing building and site demolition drawings from the early bid package currently under construction will be provided for reference in the next submission.

- Architectural drawings showing the following:
  - Floor plans of each floor, with dimensions, column locations, floor elevations, door and window designations, partition types, built in furniture and equipment, keyed to other architectural drawings and coordinated with exterior grade elevations at all interior/exterior transitions. *The floor elevations are not included. Please include them in the next submission. Window designations are not included on the floor plan, but appear to be included on the elevations; confirm as part of the response to these review comments.*

  Response: Agreed. Floor elevations will be included in the next submission. Window designations are included in the elevations.

  - Large scale floor plans where required.
  - Roof plans including equipment.
  - Key plans / overall plans where required.
  - Building Sections updated and coordinated with plans and elevations.
  - Building elevations. All building elevations, including hidden elevations, fully developed, showing context and relation to exterior sloping grade around the building.
  - Wall sections indicating dimensions, flashing, anchorage, reinforcing, coursing, cladding, and all other conditions at wall, roof, foundation, interior floors.
  - Exterior details, for roofing, flashing and other details showing all major conditions.

- Door, window, entrance, curtain wall and storefront, schedules, and details.
- Vertical circulation plans, sections and details including ramps, stairs, lifts and elevators.
- Guardrails and handrails including details.
- Interior elevations of all significant and typical spaces.
- Interior details including casework, paneling surfacing and acoustical treatment.
- Reflected ceiling plans coordinated with fire protection, mechanical and electrical drawings.
- Ceiling details.
- Schedules (clearly define new or existing):
    - Doors.
    - Equipment, e.g. for services.
    - Partitions.
    - Finishes.

- Structural drawings showing the following: *Structural drawings are not included in the submission, and based on the schedule, may have been included in an early bid package. Therefore, compliance with the following could not be confirmed. Consider providing these drawings in the next submission for clarity.*

Response: Agreed. Structural drawings from the early bid package currently in the bidding process will be provided for reference in the next submission.

- Legend and/or graphical symbols on the first sheet of the structural drawings.
- Foundation plans with bottom grades showing layout of all footings, walls, slabs on grade including reinforcing, grade beams, and columns; include design soil bearing pressures and live loads for each area.
- Floor and roof plans of structural systems including framing, grades of finished floors and depressed areas, with locations and dimensions for all openings, coordinated with the architectural drawings.
- Complete foundation wall elevation and typical sections, with reinforcing indicating location, dimensions and grades for all footings, steps and wall openings.
- Complete details and section with dimensions for all construction including expansion and construction joints, reinforcing and other embedded items. Coordinate construction and expansion joint details with specified materials including caulking and sealant.
- Schedules (with dimensions) for all lintels, beams, joists, and columns. Coordinate dimensions of all elements listed in the schedules with dimensions depicted on the plans.
- Structural supports required for mechanical equipment.
- General notes including the following information: class and 28-day strength of concrete for each portion, structural steel and concrete

reinforcing design stresses for each type of structural member, concrete cover for each type of structural member, shrinkage and temperature steel requirements, reinforcing laps for main reinforcing and temperature steel; bend point, cutoff, and hook locations for all members, minimum beam and lintel bearing.

- MSBA requires submission of a structural engineering peer review as part of the Final (100%) Construction Documents submission, to include documentation of resolution of any issues identified by the Peer Reviewer. Actions are to be advanced well prior to the 90% CD submission to engage the peer reviewer, and that scheduling be arranged to allow final structural design drawings and calculations to be submitted to the peer reviewer at the time of completion of the 90% Construction Documents submittal, in order to incorporate comments and response action reporting in the final construction documents and avoid delays. *As part of the response to these review comments, confirm compliance with this requirement.*

- Fire protection drawings showing the following:
  - Legend and/or graphical symbols on the first sheet of the fire protection drawings.
  - Standpipe systems, sprinkler systems, suppression systems, fire pump where required, accessories, and piping.
  - All piping, equipment, fixtures, valves and devices. *Most of the piping is not included in the Fire Protection plans. Confirm that all piping will be included in the next submission.*

    Response: Agreed. To be provided in the next submission.

  - Design criteria shall be provided on the drawings in accordance with NFPA requirements.
- Plumbing drawings showing the following:
  - Legend and/or graphical symbols on the first sheet of the plumbing drawings.
  - All work done by the Plumbing Subcontractor, which includes all water, gas, air, vacuum, medical gases, sanitary and storm wastes, and accessories.
  - Trapping and venting of all plumbing fixtures including floor drains. Provide location dimensions for floor drains in coordination with the structural plans.
  - Water and gas supply sources, storm and sanitary discharge mains.
  - All piping sizes shall be indicated on drawings and riser diagrams. Indicate all directions of flow and pitch on piping.
  - All accessories, valves, fixtures including all drinking fountains and grease traps for kitchen waste.
  - All piping and connections required for other trades (e.g., kitchen equipment, HVAC make-up water, etc.).
  - Acid waste (where required), vents and neutralization systems for laboratories.

- Plumbing riser diagrams.
- Domestic water booster pumps, boiler feed water, meter location, hose bibs.
- Domestic hot water: storage tanks, piping material, hanger details.
- Backflow preventers, and cleanouts.

- Heating, Ventilating and Air Conditioning Drawings s showing the following:
  - Legend and/or graphical symbols on the first sheet of the mechanical drawings. *The legend is not included on the first sheet of the mechanical drawings; however, they are included on a later sheet. Consider including them on the first sheet for clarity.*

  Response: Agreed. To be considered for the next submission.

  - Large scale plans of all mechanical & electrical spaces showing equipment to scale. *The large-scale plan of the electrical room is not included. Confirm it will be included in the next submission.*

  Response: Agreed. To be provided in the next submission.

  - All piping and ductwork systems shall be located and sized. All ductwork shall be shown double line and drawn to scale.
  - All systems shall be sized at all reductions and riser diagrams of piping and duct systems shall be indicated. *The riser diagram for the duct system is not included. Confirm it will be included in the next submission.*

  Response: Agreed. To be provided in the next submission.

  - All directions of flow and pitch on piping, and direction of flow and volumes for duct systems shall be indicated.
  - All equipment shall have sufficient servicing and/or replacement space indicated on drawings. *Service and replacement spaces are not indicated in the plans. Please include them in the next submission.*

  Response: Agreed. To be provided in the next submission.

  - All equipment, accessories, valves and dampers identified as to type and size.
  - Cooling system pumps, chillers, cooling towers, air handling units, ductwork system and dampers, fan details, temperature control system, air and hydronic balancing equipment, and schedules shall be indicated.
  - Cooling tower (where required) shall be indicated on the drawings showing site location, elevations and floor plan of equipment layout and typical flow diagram as related to the total HVAC system. *Not applicable.*
  - All fire and smoke dampers, access panels and doors. *Access panels are not included. Please include them in the next submission.*

  Response: Agreed. To be provided in the next submission.

  - Mechanical room designs:

- Vent pipes for safety valves, relief valves, back pressure valves and tanks shall be extended above flat roofs in accordance with all governing authorities.
- In all designs for boiler and refrigeration plants, include a complete floor plan indicating location of all major mechanical equipment and sufficient service space. *The service space for the mechanical equipment is not indicated on the plan. Confirm these spaces will be identified in the next submission.*

Response: Agreed. To be identified in the next submission.

- In designs of new and/or replacement boiler and refrigeration plants, provide a flow diagram detailing steam or hot water distribution systems, return systems, including all existing equipment and their function, as well as any proposed expansions with all necessary instrumentation and controls.

- Electrical Drawings showing the following:
  - Legend and/or graphical symbols on the first sheet of the electrical drawings.
  - General arrangement: Outline layout of each floor.
  - Indicate interface with other systems. Identify any work by general contractor or other trades.
  - Interior lighting system: Light fixture schedules, circuiting location and mounting heights of all fixtures, receptacle and switch outlets, sizes and types of all lamps, conduits, all other accessories and riser diagrams shall be indicated on drawings. Designer shall specify that all electrical lighting fixtures be supported from the building structure, and shall be independent of ducts, pipes, ceilings and their supporting members. Comply with seismic design criteria. *The mounting heights for fixtures and a riser diagram for the lighting are not included. Please include them in the next submission.*

Response: Agreed. To be provided in the next submission.

  - Power system: Locations, types and method of control for all motors, heaters, appliances, controllers, starters, branch circuits, feeder conductors and conduits. Indicate riser diagrams. Show details and indicate method of supporting electrical conduit. For larger projects, thermostats and control wiring are normally covered under the HVAC sub-contract, assure coordination.
  - Fire Alarm, Data, Communications, CATV/CCTV Systems: Locations and types of all devices, outlets and equipment, service connections, wiring diagrams, all other essential details.
  - Services: Location and details of all services, whether overhead or underground, feeder sizes, plans and elevations of switchgear and transformers, metering and service switchboard arrangements, wiring and ground fault diagram and bus ducts.

- General and sub-stations: Location, size, method of connection and protection of all generators, transformers, exciters, motor generators, switch gear, and associated equipment, current characteristics and equipment capacities. Indicate equipment connections by means of one line and/or wiring diagrams and schedule all major items of equipment and all instruments.
- Underground work: The size and locations of manholes and types of cables, number, size, and location of ducts, locations, sizes and types of cable supports, fireproofing, duct line profile, and one-line diagram of connections.
- Pole line work: Location, length, treatment and class of poles, guying, cross arms, insulators, circuiting, transformers, protective and switching devices, lightning arresters, special structures, diagrams, current characteristics and grounding.
- Exterior lighting: Location, size, and type of transformers, luminary, poles, light standards, cables, ducts, and manholes, details of control equipment and connection diagrams.
- Emergency system (where provided) details including transfer switch, type of fuel.
- One-line diagram indicating load KVA, and available short circuit amperes at each transformer, switchboard, distribution panel board, branch circuit panel board, and at major pieces of equipment.
- Riser diagrams for all system.

**6B.3.6 Project Manual** (developed to 60% CD progress level)

- The format for the technical specifications shall be CSI Master format (current version) with separate sections for each of class of work required by M.G.L. c. 149 §44F.
- For each item of material or equipment, the specifications shall provide for a minimum of three named brands of material or equipment and the words "or equal" or a description of material or equipment which can be met by a minimum of three manufacturers or producers, and the words "or equal". Proprietary products shall not be specified except as provided by M.G.L. c. 30, § 39M; however, when they are specified, proprietary specifications are subject to the "or equal" provisions of c. 30, § 39M.
- Do not specify that a product or system shall require prequalification for use prior to bidding.
- Include a copy of the geotechnical report, including locations and dates of test boring holes and results of soil investigation, including water levels, allowable solid bearing pressure and bottom grades of footing and slabs.
- List all required filed sub-bids specification sections.
- Each filed sub-bid section shall detail all labor and materials required by the particular sub-trade. *It does not appear that the list of relevant drawings is included in all the filed sub-bid sections. For example, they are missing from*

*Section 07 00 01 and Section 08 00 08. This should be included prior to the next submission.*

Response: Agreed. To be provided in the next submission.

- Staging, scaffolding cutting and patching, refuse collection and disposal, demolition work and cleaning task, allocation policy and proposed language shall be carefully assigned to avoid duplication or omission. *It does not appear this is fully coordinated. For example, Section 26 00 10 Electrical states that all staging and scaffolding over eight feet shall be furnished, installed and maintained by the General Contractor and all staging up to eight feet provided by the non-trade and trade contractor. This language is not coordinated with Section 01 50 00 Temporary Facilities. This should be reviewed and coordinated in the next submission.*

Response: Agreed. To be coordinated in the next submission.

- Describe the extent of the work, the materials and workmanship, and include the work under the proper section. If any portion of the work included in a section of the specifications is to be performed by a trade covered by another section, there shall be clear and distinct cross-referencing between the sections. Merely to state "by others" is not acceptable.
- All "Work by Others" specification references are coordinated.
- Specify work in appropriate Sections according to local trade jurisdiction.
- In sections for which filed sub-bids are required, refrain from using such terms as "the Contractor," the "Heating Contractor," or "the Plumbing Contractor," but where necessary for clarity refer to the "HVAC Subcontractor," the "General Contractor" and so on. *The term "the Contractor" is used throughout the Project Manual. For clarity, this term should be replaced with the term "General Contractor" prior to the next submission.*

Response: Agreed. To be clarified in the next submission.

- Alternates, if approved in writing by the owner, shall be properly described and cross-referenced in the project manual and drawings. *Alternate 1 is defined in the Project Manual; however, it is not clearly shown in the drawings. This should be coordinated and shown on the drawings prior to the next submission.*

Response: Agreed. To be coordinated in the next submission.

- Allowances are prohibited pursuant to M.G.L. c. 149, § 44G(A)
- Unit price items, if permitted or ordered by the owner, shall be properly described in the specifications. *Section 01 22 00 Unit Prices refers to Document 00 54 22 – Bid Attachment Unit Prices Schedule. This schedule is not included in the submission. This should be review and provided in the next submission.*

Response: Agreed. To be provided in the next submission if applicable.

- Do not use general clauses intended to be all-inclusive in lieu of complete descriptions.
- Do not duplicate standard requirements that are contained in the contract form.
- Use consistency throughout. The word "will" shall be used to designate what the owner, authority, owner's project manager, or the designer can be expected to do, and the word "shall" shall be used to designate what is mandatory for the contractor or subcontractors to do. *The words "will" and "shall" are used interchangeably throughout the Project Manual. This should be reviewed and coordinated prior to the next submission.*

Response: Agreed. To be coordinated in the next submission.

- Use the same term throughout for the same subject and the term shall be the same as that used on the drawings. *Many of the section drawings and details are not fully developed and are missing notes, as is typical at 60% CDs; therefore, similar term usage could not be fully confirmed. This should be reviewed and provided in the next submission.*

Response: Agreed. To be coordinated in the next submission.

- Do not use the term "etc." *There are several instances throughout the Project Manual that use the word "etc." This should be reviewed and revised prior to the next submission.*

Response: Agreed. To be revised in the next submission.

- Avoid such terms as "to the satisfaction of the designer", "as directed by the designer", "as approved" and "as required." *"As approved by Architect", "to the satisfaction of the Designer/Architect", "as directed by Architect" and "as required" is used throughout the project manual. This should be reviewed and revised in the next submission.*

Response: Agreed. To be revised in the next submission.

- Avoid the use of symbols.
- Do not give numbers both in words and figures. Numbers less than 10 shall be written in words, 10 and higher numbers shall be written in figures. In expressing dimensions, figures such as 2 in., 16 in., 7 ft., 6 in., shall be used. *Numbers are written in both words and figures. This should be reviewed and revised in the next submission.*

Response: Agreed. To be revised in the next submission.

- Specify materials mined or manufactured in Massachusetts first and the United States of America second whenever possible.

**6B.3.7 Project Coordination**

- Verify all details are accurately cross-referenced to the correct plan sheet. *Details are not cross referenced to the plans. This should be reviewed and coordinated in the next submission.*

Response: Agreed. To be coordinated in the next submission.

- Verify that the structural, mechanical, or other disciplines, do not conflict with architectural plans or specifications.
- Structural dimensions match architectural drawings. *No structural drawings were included in the set for review; therefore, coordination could not be reviewed. See other note regarding structural drawings in section 6B.3.5 of this review.*

Response: Agreed. Structural drawings from the early bid package currently in the bidding process will be provided for reference in the next submission.

- Column orientation matches architectural drawings. *The columns are not included in the fire protection, plumbing and mechanical plans. Please include them in the next submission.*

Response: Agreed. To be provided in the next submission.

- Column grid lines match architectural drawings. *The columns grid lines are not included in the fire protection, plumbing and mechanical plans. Please include them in the next submission.*

Response: Agreed. To be provided in the next submission.

- Column and bearing wall locations match architectural drawings. *No structural drawings were included in the set for review; therefore, coordination could not be reviewed. See other note regarding structural drawings in section 6B.3.5 of this review.*

Response: Agreed. Structural drawings from the early bid package currently in the bidding process will be provided for reference in the next submission.

- Column locations coordinated with all other disciplines. *The columns are not included in the fire protection, plumbing and mechanical plans. Please include them in the next submission.*

Response: Agreed. To be provided in the next submission.

- Seismic detailing coordinates with architectural drawings. *No structural drawings were included in the set for review; therefore, coordination could not be reviewed. See other note regarding structural drawings in section 6B.3.5 of this review.*

Response: Agreed. Structural drawings from the early bid package currently in the bidding process will be provided for reference in the next submission.

- Beams and columns protruding horizontally and vertically into stairwells, and other interior spaces. *No structural drawings were included in the set*

*for review; therefore, coordination could not be reviewed. See other note regarding structural drawings in section 6B.3.5 of this review.*

Response: Agreed. Structural drawings from the early bid package currently in the bidding process will be provided for reference in the next submission.

- The finish grade elevations coordinated between all disciplines. *The finish floor elevations are not included in the architectural plans and there are no site drawings in the set. Please coordinate in the next submission.*

Response: Agreed. Finish floor elevations will be included and Site drawings from the early bid package currently in construction will be provided for reference in the next submission.

- Mechanical equipment power requirements and physical locations, including special information as to who mounts, connects, tests, etc.
- Verification of potential spatial conflicts in mechanical equipment.
- Room wall/floor/ceiling construction coordinated with the finish schedule. *There are no partition types included with ceramic tile or backer board. Please coordinate in the next submission.*

Response: Agreed. To be coordinated in the next submission.

- Civil earthwork grading and excavation plans are coordinated with architectural and landscape plans. *The civil plans are not included in the set; therefore, coordination could not be confirmed. Consider providing civil drawings in the next submission.*

Response: Agreed. Site drawings from the early bid package currently in construction will be provided for reference in the next submission.

- All room numbers are coordinated between all disciplines. *The room numbers are missing from the fire protection and plumbing plans, and they are illegible on the mechanical and electrical plans. Please include them in the next submission.*

Response: Agreed. To be provided and clarified in the next submission.

- Equipment plan coordinates with architectural plans.
- All kitchen equipment connected to utility.

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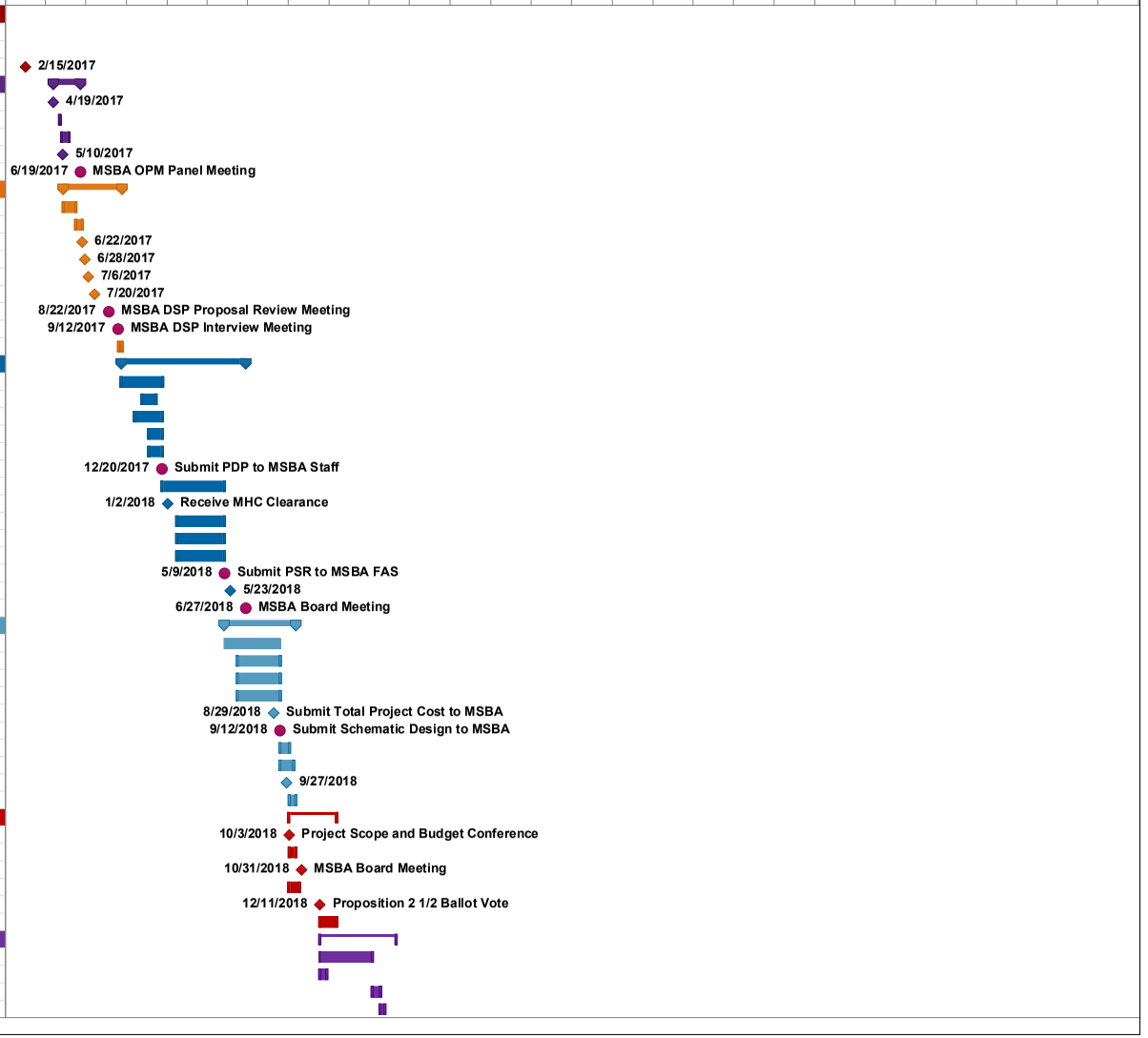
City of Framingham
New Fuller Middle School
Project Schedule

PROJECT MANAGEMENT SMMA

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 1 | **MSBA PREREQUISITES** | 496 days | 3/13/2015 | 2/15/2017 |
| 2 | Original Statement of Interest (SOI) Submission | 0 days | 3/13/2015 | 3/13/2015 |
| 3 | MSBA Invite into Eligibility | 0 days | 5/25/2016 | 5/25/2016 |
| 4 | Execute Feasibility Study Agreement (FSA) | 0 days | 2/15/2017 | 2/15/2017 |
| 5 | **RETAIN OPM** | 43 days | 4/19/2017 | 6/19/2017 |
| 6 | Submit OPM Proposals | 0 days | 4/19/2017 | 4/19/2017 |
| 7 | OPM Interview | 1 day | 5/3/2017 | 5/3/2017 |
| 8 | Negotiate OPM Contract | 12 days | 5/8/2017 | 5/23/2017 |
| 9 | Submit Documents to MSBA OPM Panel | 0 days | 5/10/2017 | 5/10/2017 |
| 10 | **MSBA OPM Panel Meeting** | **0 days** | **6/19/2017** | **6/19/2017** |
| 11 | **RETAIN DESIGNER** | 93 days | 5/11/2017 | 9/20/2017 |
| 12 | Draft Designer RFS and Submit to MSBA | 21 days | 5/11/2017 | 6/8/2017 |
| 13 | MSBA Approve Draft RFS | 11 days | 6/8/2017 | 6/22/2017 |
| 14 | Submit to Central Register | 0 days | 6/22/2017 | 6/22/2017 |
| 15 | Notice in Central Register | 0 days | 6/28/2017 | 6/28/2017 |
| 16 | Briefing Session | 0 days | 7/6/2017 | 7/6/2017 |
| 17 | Submit Designer Proposals | 0 days | 7/20/2017 | 7/20/2017 |
| 18 | **MSBA DSP Proposal Review Meeting** | **0 days** | **8/22/2017** | **8/22/2017** |
| 19 | **MSBA DSP Interview Meeting** | **0 days** | **9/12/2017** | **9/12/2017** |
| 20 | Negotiate Designer Contract | 6 days | 9/13/2017 | 9/20/2017 |
| 21 | **FEASIBILITY STUDY (FS)** | 198 days | 9/19/2017 | 6/27/2018 |
| 22 | Develop Preliminary Design Program (PDP) | 67 days | 9/19/2017 | 12/21/2017 |
| 23 | Submit PNF to MHC | 23 days | 11/5/2017 | 12/6/2017 |
| 24 | Community Presentations | 44 days | 10/19/2017 | 12/20/2017 |
| 25 | Town Council Presentations | 22 days | 11/20/2017 | 12/20/2017 |
| 26 | School Committee Presentations | 22 days | 11/20/2017 | 12/20/2017 |
| 27 | **Submit PDP to MSBA Staff** | **0 days** | **12/20/2017** | **12/20/2017** |
| 28 | Develop Preferred Schematic Report (PSR) | 99 days | 12/20/2017 | 5/9/2018 |
| 29 | Receive MHC Clearance | 0 days | 1/2/2018 | 1/2/2018 |
| 30 | Community Presentations | 78 days | 1/22/2018 | 5/9/2018 |
| 31 | City Council Presentations | 78 days | 1/22/2018 | 5/9/2018 |
| 32 | School Committee Presentations | 78 days | 1/22/2018 | 5/9/2018 |
| 33 | **Submit PSR to MSBA FAS** | **0 days** | **5/9/2018** | **5/9/2018** |
| 34 | **FAS Presentation** | **0 days** | **5/23/2018** | **5/23/2018** |
| 35 | **MSBA Board Meeting** | **0 days** | **6/27/2018** | **6/27/2018** |
| 36 | **SCHEMATIC DESIGN (SD)** | 114 days | 5/9/2018 | 10/17/2018 |
| 37 | Develop Schematic Design | 89 days | 5/9/2018 | 9/12/2018 |
| 38 | Community Presentations | 67 days | 6/8/2018 | 9/12/2018 |
| 39 | City Council Presentations | 67 days | 6/8/2018 | 9/12/2018 |
| 40 | School Committee Presentations | 67 days | 6/8/2018 | 9/12/2018 |
| 41 | Submit Total Project Cost to MSBA | 0 days | 8/29/2018 | 8/29/2018 |
| 42 | **Submit Schematic Design to MSBA** | **0 days** | **9/12/2018** | **9/12/2018** |
| 43 | MSBA Review Schematic Design (SD) Submission | 16 days | 9/12/2018 | 10/3/2018 |
| 44 | DESE Review | 23 days | 9/12/2018 | 10/12/2018 |
| 45 | DESE Approval | 0 days | 9/27/2018 | 9/27/2018 |
| 46 | Respond to MSBA Comments | 11 days | 10/3/2018 | 10/17/2018 |
| 47 | **PROJECT SCOPE AND BUDGET** | 75 days | 10/2/2018 | 1/17/2019 |
| 48 | Project Scope and Budget Conference | 0 days | 10/3/2018 | 10/3/2018 |
| 49 | Execute Scope and Budget Agreement | 11 days | 10/3/2018 | 10/17/2018 |
| 50 | **MSBA Board Meeting** | **0 days** | **10/31/2018** | **10/31/2018** |
| 51 | City Council Meeting to Vote Funds for Total Project Budget | 18 days | 10/2/2018 | 10/25/2018 |
| 52 | Proposition 2 1/2 Ballot Vote | 0 days | 12/11/2018 | 12/11/2018 |
| 53 | Execute Project Funding Agreement | 26 days | 12/11/2018 | 1/17/2019 |
| 54 | **DESIGN DEVELOPMENT** | 122 days | 12/11/2018 | 5/31/2019 |
| 55 | Develop Design Development Documents to Estimator | 82 days | 12/12/2018 | 4/8/2019 |
| 56 | LEED-S Registration | 11 days | 12/11/2018 | 12/26/2018 |
| 57 | Design Development Cost Estimate | 15 days | 4/8/2019 | 4/26/2019 |
| 58 | Value Engineering | 7 days | 4/26/2019 | 5/6/2019 |

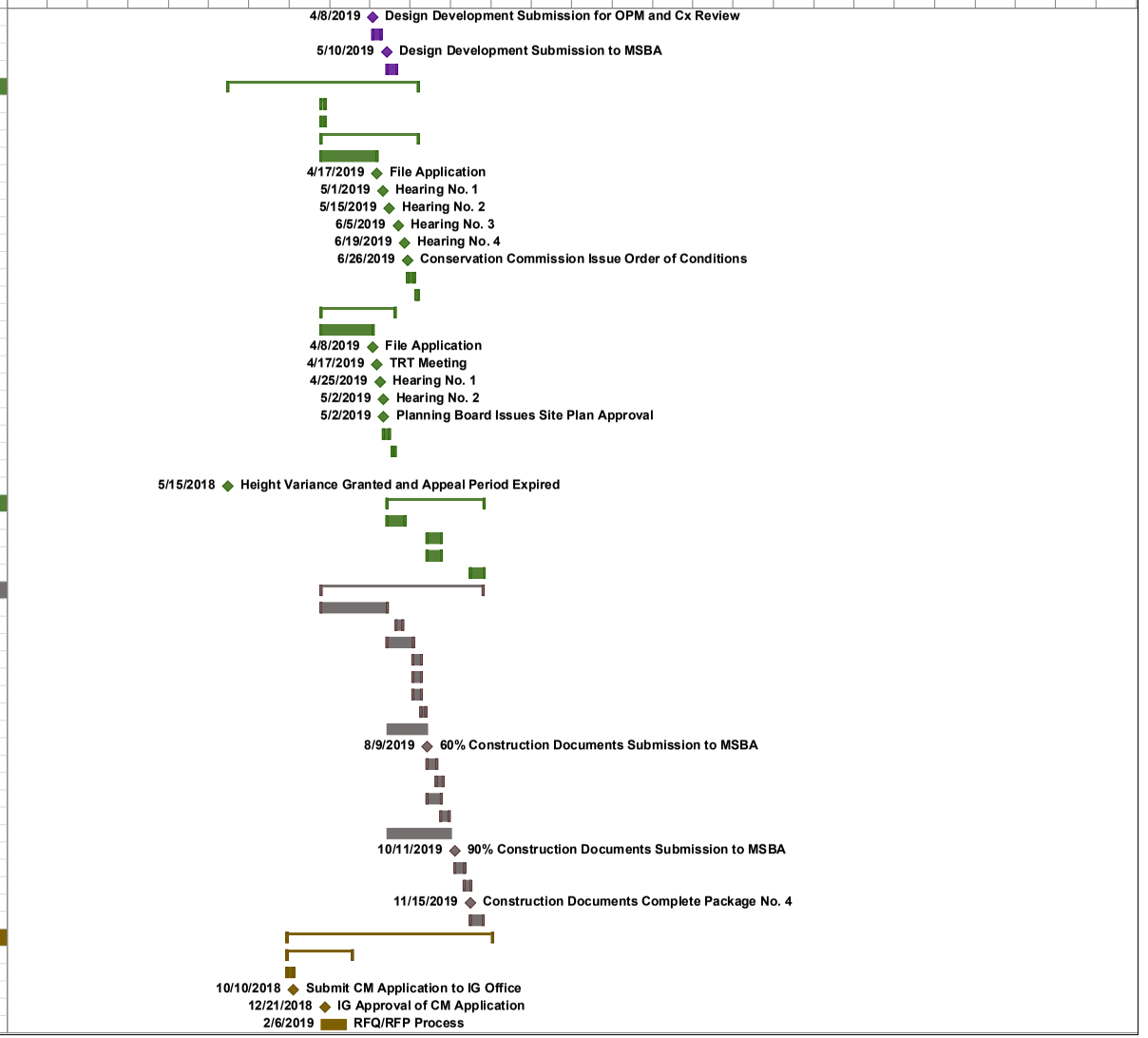


Updated September 10, 2019

City of Framingham
New Fuller Middle School
Project Schedule

PROJECT MANAGEMENT SMMA

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 59 | Design Development Submission for OPM and Cx Review | 0 days | 4/8/2019 | 4/8/2019 |
| 60 | OPM and Cx Review | 15 days | 4/8/2019 | 4/26/2019 |
| 61 | **Design Development Submission to MSBA** | **0 days** | **5/10/2019** | **5/10/2019** |
| 62 | MSBA Comments | 16 days | 5/10/2019 | 5/31/2019 |
| 63 | **SITE PERMITTING** | **303 days** | **5/15/2018** | **7/19/2019** |
| 64 | **Framingham Conservation Commission - ANRAD** | **7 days** | **12/12/2018** | **12/20/2018** |
| 65 | Separate ANRAD not required; Delineation reviewed by Staff | 7 days | 12/12/2018 | 12/20/2018 |
| 66 | **Framingham Conservation Commission - NOI** | **155 days** | **12/12/2018** | **7/19/2019** |
| 67 | Prepare Application Documents | 89 days | 12/12/2018 | 4/17/2019 |
| 68 | File Application | 0 days | 4/17/2019 | 4/17/2019 |
| 69 | Hearing No. 1 | 0 days | 5/1/2019 | 5/1/2019 |
| 70 | Hearing No. 2 | 0 days | 5/15/2019 | 5/15/2019 |
| 71 | Hearing No. 3 | 0 days | 6/5/2019 | 6/5/2019 |
| 72 | Hearing No. 4 | 0 days | 6/19/2019 | 6/19/2019 |
| 73 | Conservation Commission Issue Order of Conditions | 0 days | 6/26/2019 | 6/26/2019 |
| 74 | Appeal Period | 10 days | 6/26/2019 | 7/10/2019 |
| 75 | File at Registry | 5 days | 7/15/2019 | 7/19/2019 |
| 76 | **Framingham Planning Board - Limited Site Plan Review - Dover Amend.** | **118 days** | **12/12/2018** | **5/28/2019** |
| 77 | Prepare Application Documents | 82 days | 12/12/2018 | 4/8/2019 |
| 78 | File Application | 0 days | 4/8/2019 | 4/8/2019 |
| 79 | TRT Meeting | 0 days | 4/17/2019 | 4/17/2019 |
| 80 | Hearing No. 1 | 0 days | 4/25/2019 | 4/25/2019 |
| 81 | Hearing No. 2 | 0 days | 5/2/2019 | 5/2/2019 |
| 82 | Planning Board Issues Site Plan Approval | 0 days | 5/2/2019 | 5/2/2019 |
| 83 | Appeal Period | 10 days | 5/2/2019 | 5/15/2019 |
| 84 | File at Registry | 5 days | 5/22/2019 | 5/28/2019 |
| 85 | **Framingham Zoning Board of Appeals** | **0 days** | **5/15/2018** | **5/15/2018** |
| 86 | Height Variance Granted and Appeal Period Expired | 0 days | 5/15/2018 | 5/15/2018 |
| 87 | **BUILDING PERMITTING** | **153 days** | **5/10/2019** | **12/15/2019** |
| 88 | Site Enabling and Preparation Package Permit | 29 days | 5/10/2019 | 6/19/2019 |
| 89 | Foundation Permit | 21 days | 8/9/2019 | 9/9/2019 |
| 90 | Structure Permit | 21 days | 8/9/2019 | 9/9/2019 |
| 91 | Building Permit | 21 days | 11/15/2019 | 12/15/2019 |
| 92 | **CONSTRUCTION DOCUMENTS** | **258 days** | **12/12/2018** | **12/13/2019** |
| 93 | **Early Site Enabling, and Preparation Package No. 1** | **106 days** | **12/12/2018** | **5/10/2019** |
| 94 | Incorporate MSBA DD Comments | 11 days | 5/31/2019 | 6/14/2019 |
| 95 | Develop 60% Contract Documents to Estimator | 41 days | 5/10/2019 | 7/8/2019 |
| 96 | OPM and Cx Review | 15 days | 7/8/2019 | 7/26/2019 |
| 97 | Structural Peer Review of Early Foundation and Structural Package | 15 days | 7/8/2019 | 7/26/2019 |
| 98 | 60% Construction Documents Cost Estimate | 15 days | 7/8/2019 | 7/26/2019 |
| 99 | Value Engineering | 7 days | 7/26/2019 | 8/5/2019 |
| 100 | **Early Foundation and Structural Package No. 2** | **65 days** | **5/10/2019** | **8/9/2019** |
| 101 | **60% Construction Documents Submission to MSBA** | **0 days** | **8/9/2019** | **8/9/2019** |
| 102 | MSBA Review of 60% CD Submission | 16 days | 8/9/2019 | 8/30/2019 |
| 103 | Incorporate MSBA 60% CD Comments | 10 days | 8/30/2019 | 9/13/2019 |
| 104 | Develop 90% Contract Documents to Estimator | 21 days | 8/9/2019 | 9/9/2019 |
| 105 | 90% Construction Documents Cost Estimate | 15 days | 9/9/2019 | 9/27/2019 |
| 106 | **Early Masonry Package No. 3** | **102 days** | **5/10/2019** | **10/2/2019** |
| 107 | **90% Construction Documents Submission to MSBA** | **0 days** | **10/11/2019** | **10/11/2019** |
| 108 | MSBA Review of 90% CD Submission | 16 days | 10/11/2019 | 11/1/2019 |
| 109 | Incorporate MSBA 90% CD Comments | 11 days | 11/1/2019 | 11/15/2019 |
| 110 | **Construction Documents Complete Package No. 4** | **0 days** | **11/15/2019** | **11/15/2019** |
| 111 | LEED-S Design Submission | 20 days | 11/15/2019 | 12/13/2019 |
| 112 | **PROCUREMENT** | **325 days** | **9/26/2018** | **1/3/2020** |
| 113 | **CM Selection** | **103 days** | **9/26/2018** | **2/20/2019** |
| 114 | Develop Application to Inspector General Office | 11 days | 9/26/2018 | 10/10/2018 |
| 115 | **Submit CM Application to IG Office** | **0 days** | **10/10/2018** | **10/10/2018** |
| 116 | IG Approval of CM Application | 0 days | 12/21/2018 | 12/21/2018 |
| 117 | RFQ/RFP Process | 39 days | 12/12/2018 | 2/6/2019 |

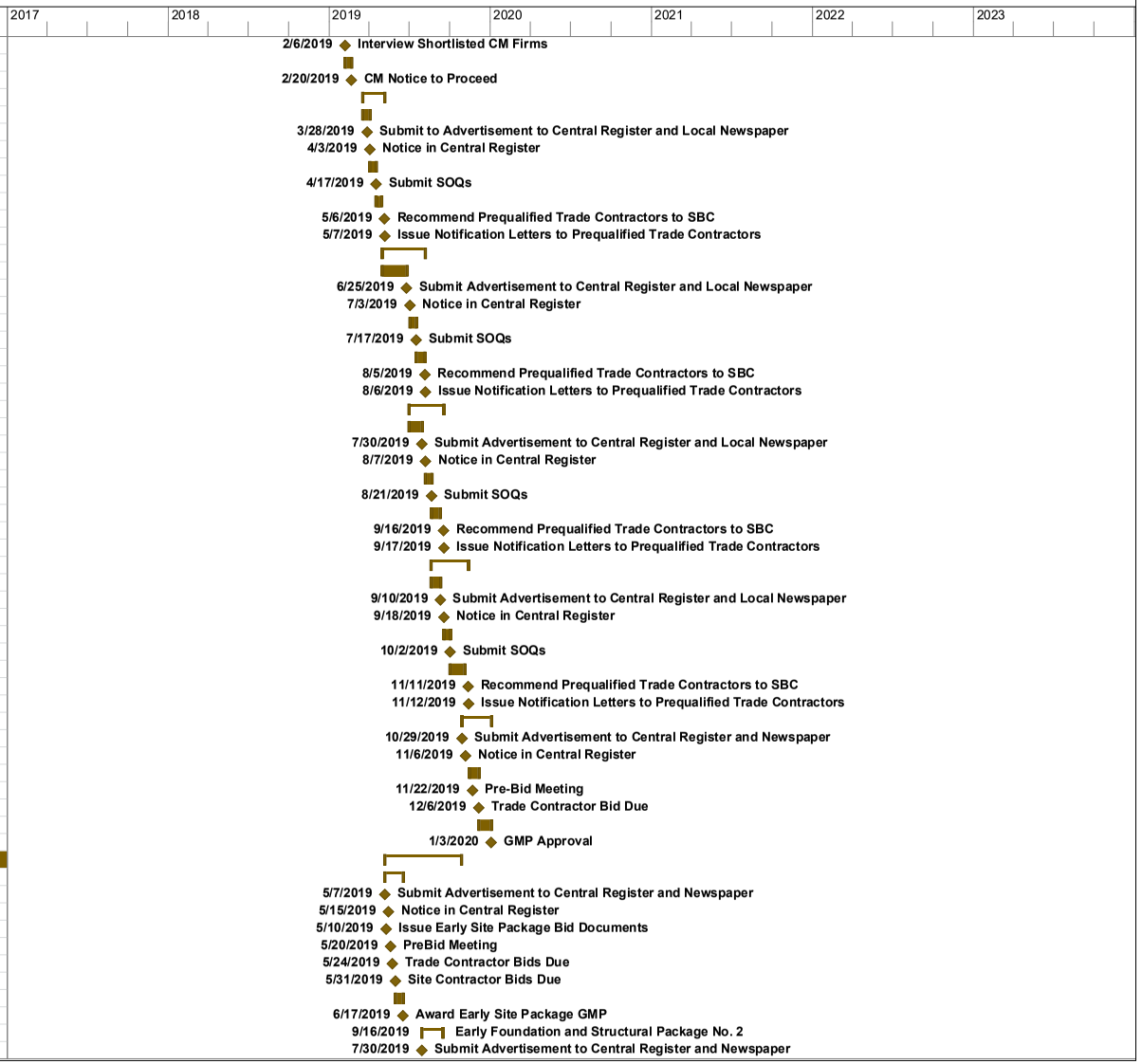


Updated September 10, 2019

City of Framingham
New Fuller Middle School
Project Schedule

PROJECT MANAGEMENT SMMA

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 118 | Interview Shortlisted CM Firms | 0 days | 2/6/2019 | 2/6/2019 |
| 119 | Negotiate and Award | 11 days | 2/6/2019 | 2/20/2019 |
| 120 | CM Notice to Proceed | 0 days | 2/20/2019 | 2/20/2019 |
| 121 | **Trade Contractors Prequalification - Package No. 1** | **36 days** | **3/18/2019** | **5/7/2019** |
| 122 | Draft RFQ | 13 days | 3/18/2019 | 4/3/2019 |
| 123 | Submit to Advertisement to Central Register and Local Newspaper | 0 days | 3/28/2019 | 3/28/2019 |
| 124 | Notice in Central Register | 0 days | 4/3/2019 | 4/3/2019 |
| 125 | Prepare SOQ | 11 days | 4/3/2019 | 4/17/2019 |
| 126 | Submit SOQs | 0 days | 4/17/2019 | 4/17/2019 |
| 127 | Review SOQs | 9 days | 4/17/2019 | 4/29/2019 |
| 128 | Recommend Prequalified Trade Contractors to SBC | 0 days | 5/6/2019 | 5/6/2019 |
| 129 | Issue Notification Letters to Prequalified Trade Contractors | 0 days | 5/7/2019 | 5/7/2019 |
| 130 | **Trade Contractors Prequalification - Package No. 2** | **69 days** | **5/1/2019** | **8/6/2019** |
| 131 | Develop Draft RFQs | 41 days | 5/1/2019 | 6/26/2019 |
| 132 | Submit Advertisement to Central Register and Local Newspaper | 0 days | 6/25/2019 | 6/25/2019 |
| 133 | Notice in Central Register | 0 days | 7/3/2019 | 7/3/2019 |
| 134 | Prepare SOQ | 10 days | 7/3/2019 | 7/17/2019 |
| 135 | Submit SOQs | 0 days | 7/17/2019 | 7/17/2019 |
| 136 | Review SOQs | 14 days | 7/17/2019 | 8/5/2019 |
| 137 | Recommend Prequalified Trade Contractors to SBC | 0 days | 8/5/2019 | 8/5/2019 |
| 138 | Issue Notification Letters to Prequalified Trade Contractors | 0 days | 8/6/2019 | 8/6/2019 |
| 139 | **Trade Contractors Prequalification - Package No. 3** | **55 days** | **7/1/2019** | **9/17/2019** |
| 140 | Develop Draft RFQs | 21 days | 7/1/2019 | 7/30/2019 |
| 141 | Submit Advertisement to Central Register and Local Newspaper | 0 days | 7/30/2019 | 7/30/2019 |
| 142 | Notice in Central Register | 0 days | 8/7/2019 | 8/7/2019 |
| 143 | Prepare SOQ | 11 days | 8/7/2019 | 8/21/2019 |
| 144 | Submit SOQs | 0 days | 8/21/2019 | 8/21/2019 |
| 145 | Review SOQs | 13 days | 8/21/2019 | 9/9/2019 |
| 146 | Recommend Prequalified Trade Contractors to SBC | 0 days | 9/16/2019 | 9/16/2019 |
| 147 | Issue Notification Letters to Prequalified Trade Contractors | 0 days | 9/17/2019 | 9/17/2019 |
| 148 | **Trade Contractors Prequalification - Package No. 4** | **60 days** | **8/20/2019** | **11/12/2019** |
| 149 | Develop Draft RFQs | 15 days | 8/20/2019 | 9/10/2019 |
| 150 | Submit Advertisement to Central Register and Local Newspaper | 0 days | 9/10/2019 | 9/10/2019 |
| 151 | Notice in Central Register | 0 days | 9/18/2019 | 9/18/2019 |
| 152 | Prepare SOQ | 11 days | 9/18/2019 | 10/2/2019 |
| 153 | Submit SOQs | 0 days | 10/2/2019 | 10/2/2019 |
| 154 | Review SOQs | 24 days | 10/2/2019 | 11/4/2019 |
| 155 | Recommend Prequalified Trade Contractors to SBC | 0 days | 11/11/2019 | 11/11/2019 |
| 156 | Issue Notification Letters to Prequalified Trade Contractors | 0 days | 11/12/2019 | 11/12/2019 |
| 157 | **100% Construction Document Package No. 4** | **46 days** | **10/29/2019** | **1/3/2020** |
| 158 | Submit Advertisement to Central Register and Newspaper | 0 days | 10/29/2019 | 10/29/2019 |
| 159 | Notice in Central Register | 0 days | 11/6/2019 | 11/6/2019 |
| 160 | Trade Contractor Bid Package | 15 days | 11/15/2019 | 12/6/2019 |
| 161 | Pre-Bid Meeting | 0 days | 11/22/2019 | 11/22/2019 |
| 162 | Trade Contractor Bid Due | 0 days | 12/6/2019 | 12/6/2019 |
| 163 | CM Develop GMP | 19 days | 12/6/2019 | 1/3/2020 |
| 164 | GMP Approval | 0 days | 1/3/2020 | 1/3/2020 |
| 165 | **EARLY PACKAGES PROCUREMENT** | **122 days** | **5/7/2019** | **10/28/2019** |
| 166 | **Early Site Package No. 1** | **30 days** | **5/7/2019** | **6/17/2019** |
| 167 | Submit Advertisement to Central Register and Newspaper | 0 days | 5/7/2019 | 5/7/2019 |
| 168 | Notice in Central Register | 0 days | 5/15/2019 | 5/15/2019 |
| 169 | Issue Early Site Package Bid Documents | 0 days | 5/10/2019 | 5/10/2019 |
| 170 | PreBid Meeting | 0 days | 5/20/2019 | 5/20/2019 |
| 171 | Trade Contractor Bids Due | 0 days | 5/24/2019 | 5/24/2019 |
| 172 | Site Contractor Bids Due | 0 days | 5/31/2019 | 5/31/2019 |
| 173 | Descoping and Development of GMP Amendment | 12 days | 5/31/2019 | 6/17/2019 |
| 174 | Award Early Site Package GMP | 0 days | 6/17/2019 | 6/17/2019 |
| 175 | **Early Foundation and Structural Package No. 2** | **33 days** | **7/30/2019** | **9/16/2019** |
| 176 | Submit Advertisement to Central Register and Newspaper | 0 days | 7/30/2019 | 7/30/2019 |

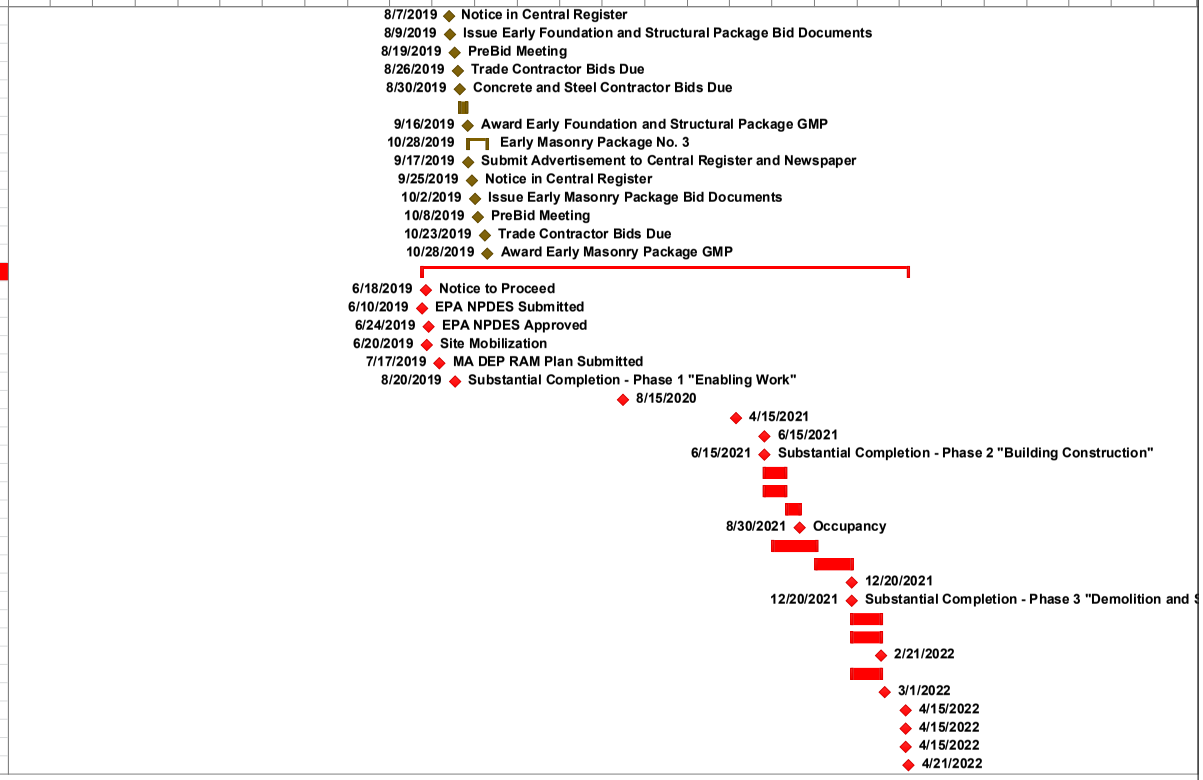


Updated September 10, 2019

City of Framingham
New Fuller Middle School
Project Schedule

PROJECT MANAGEMENT SMMA

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 177 | Notice in Central Register | 0 days | 8/7/2019 | 8/7/2019 |
| 178 | Issue Early Foundation and Structural Package Bid Documents | 0 days | 8/9/2019 | 8/9/2019 |
| 179 | PreBid Meeting | 0 days | 8/19/2019 | 8/19/2019 |
| 180 | Trade Contractor Bids Due | 0 days | 8/26/2019 | 8/26/2019 |
| 181 | Concrete and Steel Contractor Bids Due | 0 days | 8/30/2019 | 8/30/2019 |
| 182 | Descoping and Development of GMP Amendment | 10 days | 8/30/2019 | 9/13/2019 |
| 183 | Award Early Foundation and Structural Package GMP | 0 days | 9/16/2019 | 9/16/2019 |
| 184 | **Early Masonry Package No. 3** | **29 days** | **9/17/2019** | **10/28/2019** |
| 185 | Submit Advertisement to Central Register and Newspaper | 0 days | 9/17/2019 | 9/17/2019 |
| 186 | Notice in Central Register | 0 days | 9/25/2019 | 9/25/2019 |
| 187 | Issue Early Masonry Package Bid Documents | 0 days | 10/2/2019 | 10/2/2019 |
| 188 | PreBid Meeting | 0 days | 10/8/2019 | 10/8/2019 |
| 189 | Trade Contractor Bids Due | 0 days | 10/23/2019 | 10/23/2019 |
| 190 | Award Early Masonry Package GMP | 0 days | 10/28/2019 | 10/28/2019 |
| 191 | **CONSTRUCTION** | **737 days** | **6/10/2019** | **4/21/2022** |
| 192 | Notice to Proceed | 0 days | 6/18/2019 | 6/18/2019 |
| 193 | EPA NPDES Submitted | 0 days | 6/10/2019 | 6/10/2019 |
| 194 | EPA NPDES Approved | 0 days | 6/24/2019 | 6/24/2019 |
| 195 | Site Mobilization | 0 days | 6/20/2019 | 6/20/2019 |
| 196 | MA DEP RAM Plan Submitted | 0 days | 7/17/2019 | 7/17/2019 |
| 197 | **Substantial Completion - Phase 1 "Enabling Work"** | **0 days** | **8/20/2019** | **8/20/2019** |
| 198 | 50% DCAMM Evaluation | 0 days | 8/15/2020 | 8/15/2020 |
| 199 | Punch List Start | 0 days | 4/15/2021 | 4/15/2021 |
| 200 | Punch List Complete | 0 days | 6/15/2021 | 6/15/2021 |
| 201 | **Substantial Completion - Phase 2 "Building Construction"** | **0 days** | **6/15/2021** | **6/15/2021** |
| 202 | Final Completion, Closeout and Commissioning | 34 days | 6/15/2021 | 7/30/2021 |
| 203 | FFE/Technology Installation | 34 days | 6/15/2021 | 7/30/2021 |
| 204 | Teacher/Staff Move-In | 21 days | 8/2/2021 | 8/30/2021 |
| 205 | **Occupancy** | **0 days** | **8/30/2021** | **8/30/2021** |
| 206 | Abate and Demolish Existing School | 67 days | 7/3/2021 | 10/5/2021 |
| 207 | Parking Lot and Playfield Construction | 55 days | 10/4/2021 | 12/20/2021 |
| 208 | CM Request for Final Payment | 0 days | 12/20/2021 | 12/20/2021 |
| 209 | **Substantial Completion - Phase 3 "Demolition and Site Work"** | **0 days** | **12/20/2021** | **12/20/2021** |
| 210 | Closeout | 46 days | 12/20/2021 | 2/21/2022 |
| 211 | Final Completion | 46 days | 12/20/2021 | 2/21/2022 |
| 212 | 100% DCAMM Evaluation | 0 days | 2/21/2022 | 2/21/2022 |
| 213 | LEED-S Construction Submission | 46 days | 12/20/2021 | 2/21/2022 |
| 214 | MSBA Final Payment Reimbursement Request | 0 days | 3/1/2022 | 3/1/2022 |
| 215 | Commissioning Agent 10-month Inspection | 0 days | 4/15/2022 | 4/15/2022 |
| 216 | Commissioning Agent Final Report Submission to MSBA | 0 days | 4/15/2022 | 4/15/2022 |
| 217 | Commissioning Agent Submission of Certification | 0 days | 4/15/2022 | 4/15/2022 |
| 218 | USGBC Issuance of Certification | 0 days | 4/21/2022 | 4/21/2022 |



## 2.2 Project Schedule

The project schedule anticipates submission of the 90% Construction Documents on October 18, 2019. The submission dates incorporate the MSBA review periods for each submission.

The schedule anticipates early packages for sitework, foundations, steel and masonry. The Early Site Work Contract Documents were released for bid on May 10, 2019. The Early Foundation and Steel Contract Documents were released for bid on August 9, 2019. The Early Masonry Package will be released October 18, 2019.

The main package will be released on November 22, 2019 with the GMP expected in January 27, 2020. Substantial Completion of the building is scheduled for June 2021 and occupancy in August 2021. Thereafter, demolition of the existing building and construction of the playfields and parking lots will be completed by December 2021.

The following is the status of project approvals:

- DESE – Special Education approval by Department of Elementary and Secondary Education – Approved September 27, 2018
- MHC – Project Notification Form and approvals by MA Historical Commission – Approved January 2, 2018
- OIG – Construction Manager at Risk approval by the Office of Inspector General – Approved December 21, 2018
- Executive Office of Energy and Environmental Affairs / EEA:
    - MEPA – MA Environmental Policy Act by Energy & Environmental Affairs:
        - ENF – Environmental Notification Form – Not Applicable, an ENF is not required.
        - EIR – Environmental Impact Report – Not Applicable, an EIR is not required.
    - Article 97 Land Disposition Policy approval by Energy & Environmental Affairs – Not Applicable to this project.
- MA DEP – Massachusetts Department of Environmental Protection – Release Abatement Measure submitted July 17, 2019.
- MA DOT – Massachusetts Department of Transportation – Not Applicable
- MA DPH – Massachusetts Department of Public Health – Not Applicable
- EPA – NPDES National Pollutant Discharge Elimination System

Notice of Intent approval by the US Environmental Protection Agency – Submitted by CM on June 10, 2019 and approval received on June 24, 2019.

- MAAB – Accessibility variances by MA Architectural Access Board – Not Applicable as no variances are required.

- Framingham Planning Board – Site Plan Approval received on May 2, 2019.

- Framingham Conservation Commission – NOI approved on July 1, 2019

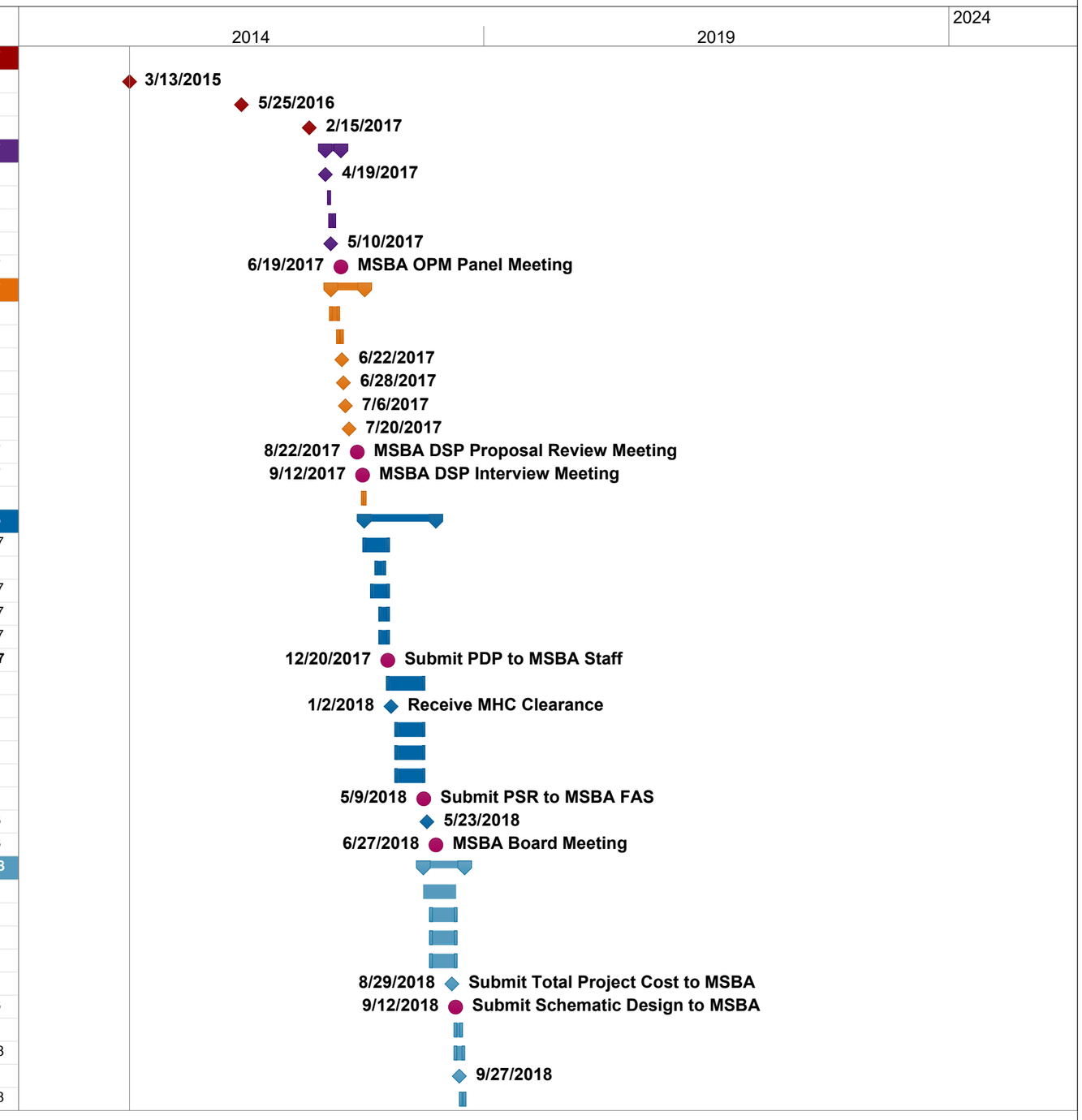
The Project Schedule is appended to the end of this section.

Updated September 27, 2019

City of Framingham
New Fuller Middle School
Project Schedule

PROJECT MANAGEMENT SMMA

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 1 | **MSBA PREREQUISITES** | **496 days** | **3/13/2015** | **2/15/2017** |
| 2 | Original Statement of Interest (SOI) Submission | 0 days | 3/13/2015 | 3/13/2015 |
| 3 | MSBA Invite into Eligibility | 0 days | 5/25/2016 | 5/25/2016 |
| 4 | Execute Feasibility Study Agreement (FSA) | 0 days | 2/15/2017 | 2/15/2017 |
| 5 | **RETAIN OPM** | **43 days** | **4/19/2017** | **6/19/2017** |
| 6 | Submit OPM Proposals | 0 days | 4/19/2017 | 4/19/2017 |
| 7 | OPM Interview | 1 day | 5/3/2017 | 5/3/2017 |
| 8 | Negotiate OPM Contract | 12 days | 5/8/2017 | 5/23/2017 |
| 9 | Submit Documents to MSBA OPM Panel | 0 days | 5/10/2017 | 5/10/2017 |
| 10 | **MSBA OPM Panel Meeting** | **0 days** | **6/19/2017** | **6/19/2017** |
| 11 | **RETAIN DESIGNER** | **93 days** | **5/11/2017** | **9/20/2017** |
| 12 | Draft Designer RFS and Submit to MSBA | 21 days | 5/11/2017 | 6/8/2017 |
| 13 | MSBA Approve Draft RFS | 11 days | 6/8/2017 | 6/22/2017 |
| 14 | Submit to Central Register | 0 days | 6/22/2017 | 6/22/2017 |
| 15 | Notice in Central Register | 0 days | 6/28/2017 | 6/28/2017 |
| 16 | Briefing Session | 0 days | 7/6/2017 | 7/6/2017 |
| 17 | Submit Designer Proposals | 0 days | 7/20/2017 | 7/20/2017 |
| 18 | **MSBA DSP Proposal Review Meeting** | **0 days** | **8/22/2017** | **8/22/2017** |
| 19 | **MSBA DSP Interview Meeting** | **0 days** | **9/12/2017** | **9/12/2017** |
| 20 | Negotiate Designer Contract | 6 days | 9/13/2017 | 9/20/2017 |
| 21 | **FEASIBILITY STUDY (FS)** | **198 days** | **9/19/2017** | **6/27/2018** |
| 22 | Develop Preliminary Design Program (PDP) | 67 days | 9/19/2017 | 12/21/2017 |
| 23 | Submit PNF to MHC | 23 days | 11/5/2017 | 12/6/2017 |
| 24 | Community Presentations | 44 days | 10/19/2017 | 12/20/2017 |
| 25 | Town Council Presentations | 22 days | 11/20/2017 | 12/20/2017 |
| 26 | School Committee Presentations | 22 days | 11/20/2017 | 12/20/2017 |
| 27 | **Submit PDP to MSBA Staff** | **0 days** | **12/20/2017** | **12/20/2017** |
| 28 | Develop Preferred Schematic Report (PSR) | 99 days | 12/20/2017 | 5/9/2018 |
| 29 | Receive MHC Clearance | 0 days | 1/2/2018 | 1/2/2018 |
| 30 | Community Presentations | 78 days | 1/22/2018 | 5/9/2018 |
| 31 | City Council Presentations | 78 days | 1/22/2018 | 5/9/2018 |
| 32 | School Committee Presentations | 78 days | 1/22/2018 | 5/9/2018 |
| 33 | **Submit PSR to MSBA FAS** | **0 days** | **5/9/2018** | **5/9/2018** |
| 34 | **FAS Presentation** | **0 days** | **5/23/2018** | **5/23/2018** |
| 35 | **MSBA Board Meeting** | **0 days** | **6/27/2018** | **6/27/2018** |
| 36 | **SCHEMATIC DESIGN (SD)** | **114 days** | **5/9/2018** | **10/17/2018** |
| 37 | Develop Schematic Design | 89 days | 5/9/2018 | 9/12/2018 |
| 38 | Community Presentations | 67 days | 6/8/2018 | 9/12/2018 |
| 39 | City Council Presentations | 67 days | 6/8/2018 | 9/12/2018 |
| 40 | School Committee Presentations | 67 days | 6/8/2018 | 9/12/2018 |
| 41 | Submit Total Project Cost to MSBA | 0 days | 8/29/2018 | 8/29/2018 |
| 42 | **Submit Schematic Design to MSBA** | **0 days** | **9/12/2018** | **9/12/2018** |
| 43 | MSBA Review Schematic Design (SD) Submission | 16 days | 9/12/2018 | 10/3/2018 |
| 44 | DESE Review | 23 days | 9/12/2018 | 10/12/2018 |
| 45 | DESE Approval | 0 days | 9/27/2018 | 9/27/2018 |
| 46 | Respond to MSBA Comments | 11 days | 10/3/2018 | 10/17/2018 |

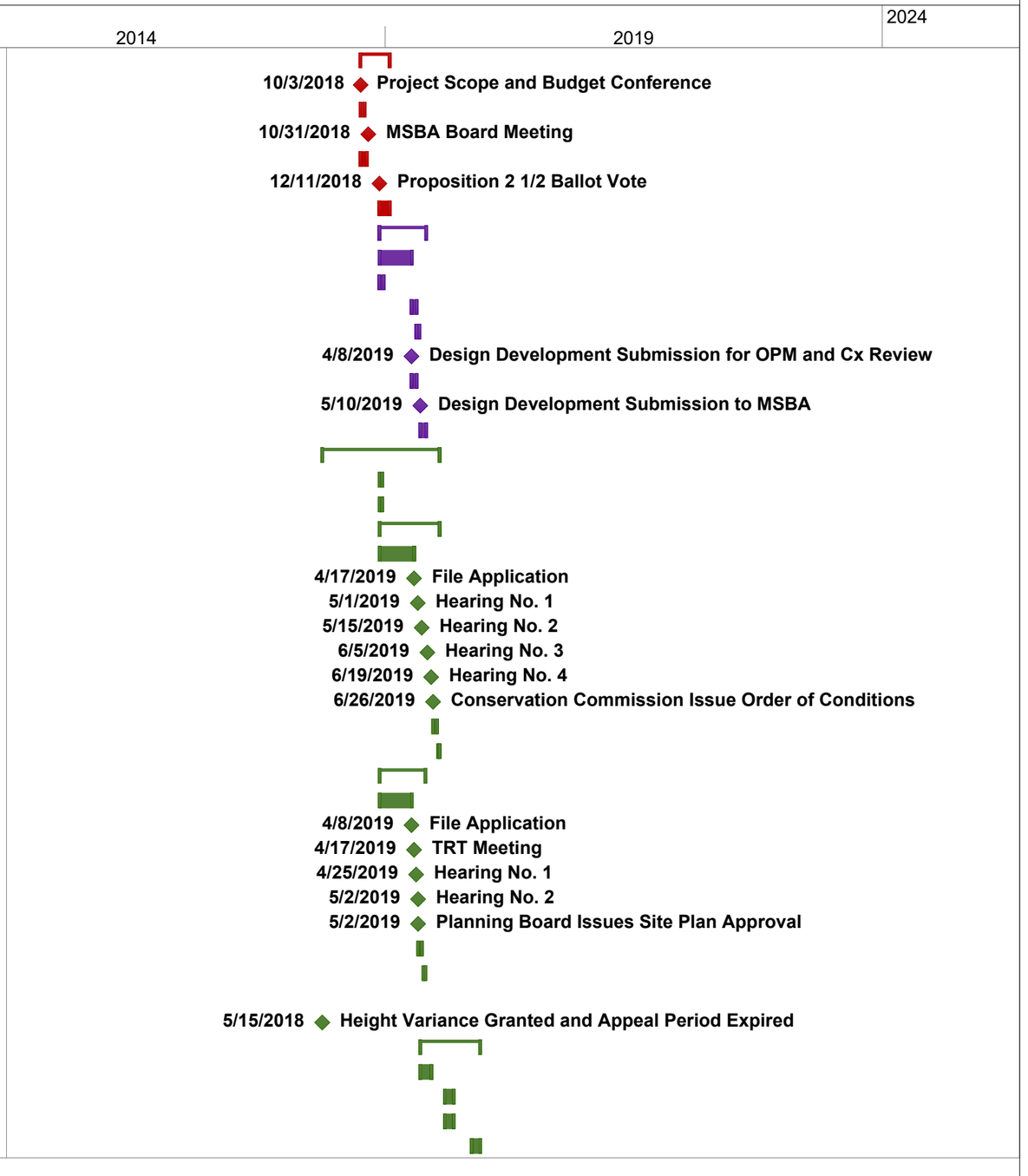


Updated September 27, 2019

City of Framingham
New Fuller Middle School
Project Schedule

PROJECT MANAGEMENT SMMA

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 47 | **PROJECT SCOPE AND BUDGET** | **75 days** | **10/2/2018** | **1/17/2019** |
| 48 | Project Scope and Budget Conference | 0 days | 10/3/2018 | 10/3/2018 |
| 49 | Execute Scope and Budget Agreement | 11 days | 10/3/2018 | 10/17/2018 |
| 50 | **MSBA Board Meeting** | **0 days** | **10/31/2018** | **10/31/2018** |
| 51 | City Council Meeting to Vote Funds for Total Project Budget | 18 days | 10/2/2018 | 10/25/2018 |
| 52 | Proposition 2 1/2 Ballot Vote | 0 days | 12/11/2018 | 12/11/2018 |
| 53 | Execute Project Funding Agreement | 26 days | 12/11/2018 | 1/17/2019 |
| 54 | **DESIGN DEVELOPMENT** | **122 days** | **12/11/2018** | **5/31/2019** |
| 55 | Develop Design Development Documents to Estimator | 82 days | 12/12/2018 | 4/8/2019 |
| 56 | LEED-S Registration | 11 days | 12/11/2018 | 12/26/2018 |
| 57 | Design Development Cost Estimate | 15 days | 4/8/2019 | 4/26/2019 |
| 58 | Value Engineering | 7 days | 4/26/2019 | 5/6/2019 |
| 59 | Design Development Submission for OPM and Cx Review | 0 days | 4/8/2019 | 4/8/2019 |
| 60 | OPM and Cx Review | 15 days | 4/8/2019 | 4/26/2019 |
| 61 | **Design Development Submission to MSBA** | **0 days** | **5/10/2019** | **5/10/2019** |
| 62 | MSBA Comments | 16 days | 5/10/2019 | 5/31/2019 |
| 63 | **SITE PERMITTING** | **303 days** | **5/15/2018** | **7/19/2019** |
| 64 | **Framingham Conservation Commission - ANRAD** | **7 days** | **12/12/2018** | **12/20/2018** |
| 65 | Separate ANRAD not required; Delineation reviewed by Staff | 7 days | 12/12/2018 | 12/20/2018 |
| 66 | **Framingham Conservation Commission - NOI** | **155 days** | **12/12/2018** | **7/19/2019** |
| 67 | Prepare Application Documents | 89 days | 12/12/2018 | 4/17/2019 |
| 68 | File Application | 0 days | 4/17/2019 | 4/17/2019 |
| 69 | Hearing No. 1 | 0 days | 5/1/2019 | 5/1/2019 |
| 70 | Hearing No. 2 | 0 days | 5/15/2019 | 5/15/2019 |
| 71 | Hearing No. 3 | 0 days | 6/5/2019 | 6/5/2019 |
| 72 | Hearing No. 4 | 0 days | 6/19/2019 | 6/19/2019 |
| 73 | Conservation Commission Issue Order of Conditions | 0 days | 6/26/2019 | 6/26/2019 |
| 74 | Appeal Period | 10 days | 6/26/2019 | 7/10/2019 |
| 75 | File at Registry | 5 days | 7/15/2019 | 7/19/2019 |
| 76 | **Framingham Planning Board - Limited Site Plan Review - Dover Amend.** | **118 days** | **12/12/2018** | **5/28/2019** |
| 77 | Prepare Application Documents | 82 days | 12/12/2018 | 4/8/2019 |
| 78 | File Application | 0 days | 4/8/2019 | 4/8/2019 |
| 79 | TRT Meeting | 0 days | 4/17/2019 | 4/17/2019 |
| 80 | Hearing No. 1 | 0 days | 4/25/2019 | 4/25/2019 |
| 81 | Hearing No. 2 | 0 days | 5/2/2019 | 5/2/2019 |
| 82 | Planning Board Issues Site Plan Approval | 0 days | 5/2/2019 | 5/2/2019 |
| 83 | Appeal Period | 10 days | 5/2/2019 | 5/15/2019 |
| 84 | File at Registry | 5 days | 5/22/2019 | 5/28/2019 |
| 85 | **Framingham Zoning Board of Appeals** | **0 days** | **5/15/2018** | **5/15/2018** |
| 86 | Height Variance Granted and Appeal Period Expired | 0 days | 5/15/2018 | 5/15/2018 |
| 87 | **BUILDING PERMITTING** | **153 days** | **5/10/2019** | **12/15/2019** |
| 88 | Site Enabling and Preparation Package Permit | 29 days | 5/10/2019 | 6/19/2019 |
| 89 | Foundation Permit | 21 days | 8/9/2019 | 9/9/2019 |
| 90 | Structure Permit | 21 days | 8/9/2019 | 9/9/2019 |
| 91 | Building Permit | 21 days | 11/15/2019 | 12/15/2019 |



Updated September 27, 2019

City of Framingham
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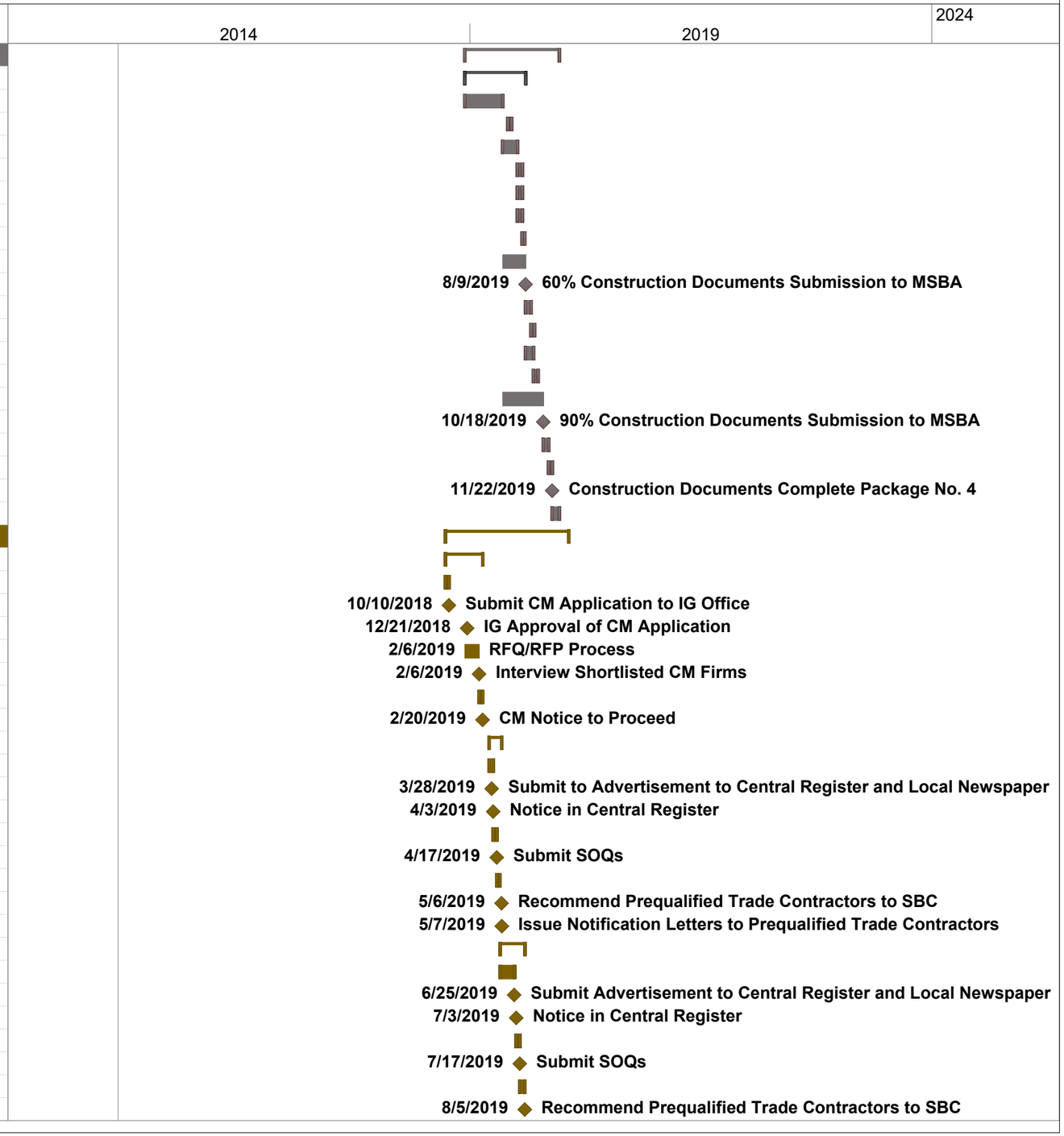
Project Schedule

PROJECT MANAGEMENT SMMA

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 92 | **CONSTRUCTION DOCUMENTS** | **263 days** | **12/12/2018** | **12/20/2019** |
| 93 | **Early Site Enabling and Foundation Packages (Nos. 1 & 2)** | **170 days** | **12/12/2018** | **8/9/2019** |
| 94 | **Early Site Enabling, and Preparation Package No. 1** | **106 days** | **12/12/2018** | **5/10/2019** |
| 95 | Incorporate MSBA DD Comments | 11 days | 5/31/2019 | 6/14/2019 |
| 96 | Develop 60% Contract Documents to Estimator | 41 days | 5/10/2019 | 7/8/2019 |
| 97 | OPM and Cx Review | 15 days | 7/8/2019 | 7/26/2019 |
| 98 | Structural Peer Review of Early Foundation and Structural Package | 15 days | 7/8/2019 | 7/26/2019 |
| 99 | 60% Construction Documents Cost Estimate | 15 days | 7/8/2019 | 7/26/2019 |
| 100 | Value Engineering | 7 days | 7/26/2019 | 8/5/2019 |
| 101 | **Early Foundation and Structural Package No. 2** | **65 days** | **5/10/2019** | **8/9/2019** |
| 102 | **60% Construction Documents Submission to MSBA** | **0 days** | **8/9/2019** | **8/9/2019** |
| 103 | MSBA Review of 60% CD Submission | 16 days | 8/9/2019 | 8/30/2019 |
| 104 | Incorporate MSBA 60% CD Comments | 10 days | 8/30/2019 | 9/13/2019 |
| 105 | Develop 90% Contract Documents to Estimator | 21 days | 8/9/2019 | 9/9/2019 |
| 106 | 90% Construction Documents Cost Estimate | 15 days | 9/9/2019 | 9/27/2019 |
| 107 | **Early Masonry Package No. 3** | **114 days** | **5/10/2019** | **10/18/2019** |
| 108 | **90% Construction Documents Submission to MSBA** | **0 days** | **10/18/2019** | **10/18/2019** |
| 109 | MSBA Review of 90% CD Submission | 16 days | 10/18/2019 | 11/8/2019 |
| 110 | Incorporate MSBA 90% CD Comments | 11 days | 11/8/2019 | 11/22/2019 |
| 111 | **Construction Documents Complete Package No. 4** | **0 days** | **11/22/2019** | **11/22/2019** |
| 112 | LEED-S Design Submission | 20 days | 11/22/2019 | 12/20/2019 |
| 113 | **PROCUREMENT** | **340 days** | **9/26/2018** | **1/27/2020** |
| 114 | **CM Selection** | **103 days** | **9/26/2018** | **2/20/2019** |
| 115 | Develop Application to Inspector General Office | 11 days | 9/26/2018 | 10/10/2018 |
| 116 | **Submit CM Application to IG Office** | **0 days** | **10/10/2018** | **10/10/2018** |
| 117 | IG Approval of CM Application | 0 days | 12/21/2018 | 12/21/2018 |
| 118 | RFQ/RFP Process | 39 days | 12/12/2018 | 2/6/2019 |
| 119 | Interview Shortlisted CM Firms | 0 days | 2/6/2019 | 2/6/2019 |
| 120 | Negotiate and Award | 11 days | 2/6/2019 | 2/20/2019 |
| 121 | CM Notice to Proceed | 0 days | 2/20/2019 | 2/20/2019 |
| 122 | **Trade Contractors Prequalification - Package No. 1** | **36 days** | **3/18/2019** | **5/7/2019** |
| 123 | Draft RFQ | 13 days | 3/18/2019 | 4/3/2019 |
| 124 | Submit to Advertisement to Central Register and Local Newspaper | 0 days | 3/28/2019 | 3/28/2019 |
| 125 | Notice in Central Register | 0 days | 4/3/2019 | 4/3/2019 |
| 126 | Prepare SOQ | 11 days | 4/3/2019 | 4/17/2019 |
| 127 | Submit SOQs | 0 days | 4/17/2019 | 4/17/2019 |
| 128 | Review SOQs | 9 days | 4/17/2019 | 4/29/2019 |
| 129 | Recommend Prequalified Trade Contractors to SBC | 0 days | 5/6/2019 | 5/6/2019 |
| 130 | Issue Notification Letters to Prequalified Trade Contractors | 0 days | 5/7/2019 | 5/7/2019 |
| 131 | **Trade Contractors Prequalification - Package No. 2** | **69 days** | **5/1/2019** | **8/6/2019** |
| 132 | Develop Draft RFQs | 41 days | 5/1/2019 | 6/26/2019 |
| 133 | Submit Advertisement to Central Register and Local Newspaper | 0 days | 6/25/2019 | 6/25/2019 |
| 134 | Notice in Central Register | 0 days | 7/3/2019 | 7/3/2019 |
| 135 | Prepare SOQ | 10 days | 7/3/2019 | 7/17/2019 |
| 136 | Submit SOQs | 0 days | 7/17/2019 | 7/17/2019 |
| 137 | Review SOQs | 14 days | 7/17/2019 | 8/5/2019 |
| 138 | Recommend Prequalified Trade Contractors to SBC | 0 days | 8/5/2019 | 8/5/2019 |



Updated September 27, 2019

City of Framingham
New Fuller Middle School
Project Schedule

PROJECT MANAGEMENT SMMA

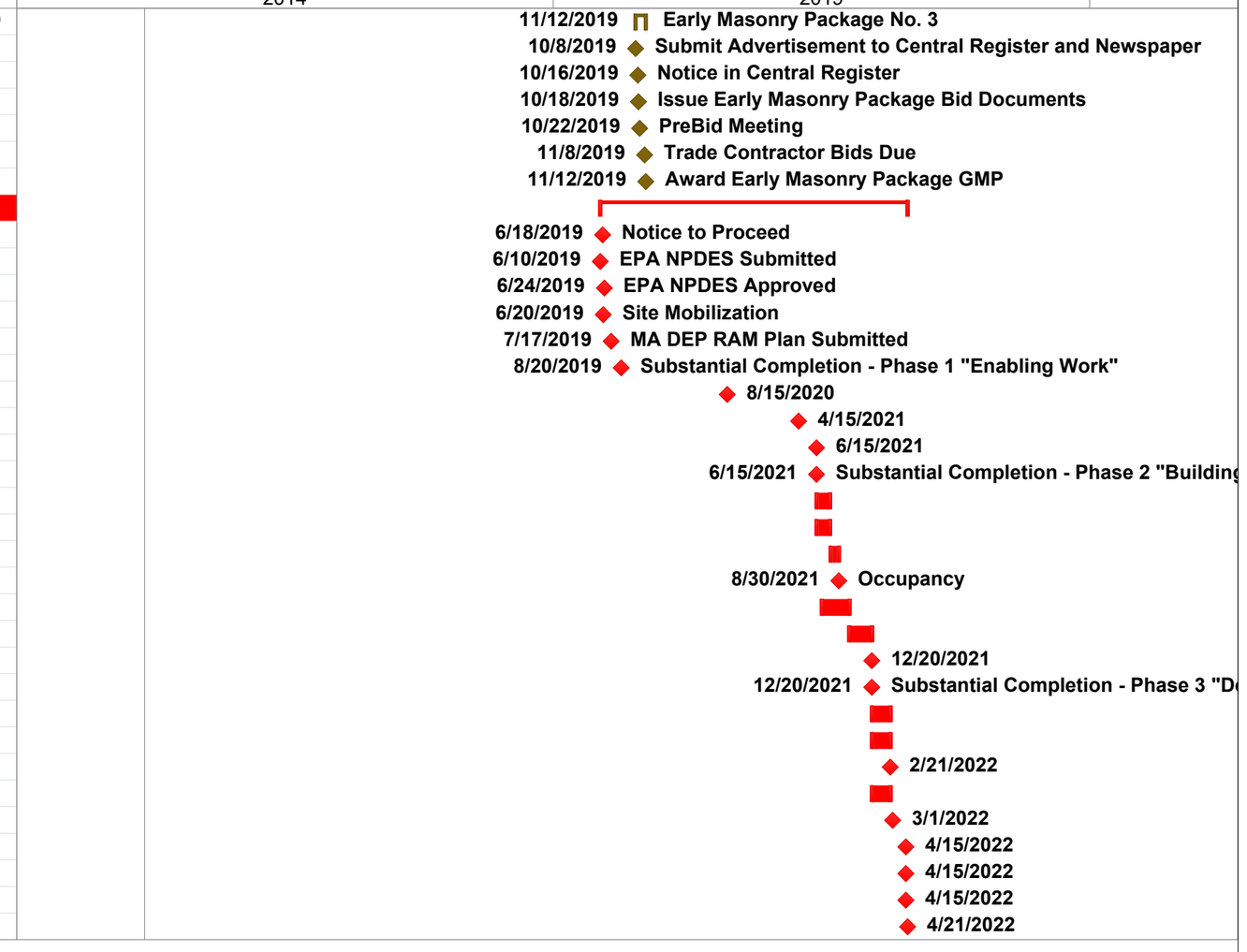
| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 139 | Issue Notification Letters to Prequalified Trade Contractors | 0 days | 8/6/2019 | 8/6/2019 |
| 140 | **Trade Contractors Prequalification - Package No. 3** | **55 days** | **7/1/2019** | **9/17/2019** |
| 141 | Develop Draft RFQs | 21 days | 7/1/2019 | 7/30/2019 |
| 142 | Submit Advertisement to Central Register and Local Newspaper | 0 days | 7/30/2019 | 7/30/2019 |
| 143 | Notice in Central Register | 0 days | 8/7/2019 | 8/7/2019 |
| 144 | Prepare SOQ | 11 days | 8/7/2019 | 8/21/2019 |
| 145 | Submit SOQs | 0 days | 8/21/2019 | 8/21/2019 |
| 146 | Review SOQs | 13 days | 8/21/2019 | 9/9/2019 |
| 147 | Recommend Prequalified Trade Contractors to SBC | 0 days | 9/16/2019 | 9/16/2019 |
| 148 | Issue Notification Letters to Prequalified Trade Contractors | 0 days | 9/17/2019 | 9/17/2019 |
| 149 | **Trade Contractors Prequalification - Package No. 4** | **60 days** | **8/20/2019** | **11/12/2019** |
| 150 | Develop Draft RFQs | 15 days | 8/20/2019 | 9/10/2019 |
| 151 | Submit Advertisement to Central Register and Local Newspaper | 0 days | 9/10/2019 | 9/10/2019 |
| 152 | Notice in Central Register | 0 days | 9/18/2019 | 9/18/2019 |
| 153 | Prepare SOQ | 11 days | 9/18/2019 | 10/2/2019 |
| 154 | Submit SOQs | 0 days | 10/2/2019 | 10/2/2019 |
| 155 | Review SOQs | 24 days | 10/2/2019 | 11/4/2019 |
| 156 | Recommend Prequalified Trade Contractors to SBC | 0 days | 11/11/2019 | 11/11/2019 |
| 157 | Issue Notification Letters to Prequalified Trade Contractors | 0 days | 11/12/2019 | 11/12/2019 |
| 158 | **100% Construction Document Package No. 4** | **51 days** | **11/12/2019** | **1/27/2020** |
| 159 | Submit Advertisement to Central Register and Newspaper | 0 days | 11/12/2019 | 11/12/2019 |
| 160 | Notice in Central Register | 0 days | 11/20/2019 | 11/20/2019 |
| 161 | Trade Contractor Bid Package | 20 days | 11/22/2019 | 12/20/2019 |
| 162 | Pre-Bid Meeting | 0 days | 12/3/2019 | 12/3/2019 |
| 163 | Trade Contractor Bid Due | 0 days | 12/20/2019 | 12/20/2019 |
| 164 | CM Develop GMP | 24 days | 12/20/2019 | 1/24/2020 |
| 165 | GMP Approval | 0 days | 1/27/2020 | 1/27/2020 |
| 166 | **EARLY PACKAGES PROCUREMENT** | **133 days** | **5/7/2019** | **11/12/2019** |
| 167 | **Early Site Package No. 1** | **30 days** | **5/7/2019** | **6/17/2019** |
| 168 | Submit Advertisement to Central Register and Newspaper | 0 days | 5/7/2019 | 5/7/2019 |
| 169 | Notice in Central Register | 0 days | 5/15/2019 | 5/15/2019 |
| 170 | Issue Early Site Package Bid Documents | 0 days | 5/10/2019 | 5/10/2019 |
| 171 | PreBid Meeting | 0 days | 5/20/2019 | 5/20/2019 |
| 172 | Trade Contractor Bids Due | 0 days | 5/24/2019 | 5/24/2019 |
| 173 | Site Contractor Bids Due | 0 days | 5/31/2019 | 5/31/2019 |
| 174 | Descoping and Development of GMP Amendment | 12 days | 5/31/2019 | 6/17/2019 |
| 175 | Award Early Site Package GMP | 0 days | 6/17/2019 | 6/17/2019 |
| 176 | **Early Foundation and Structural Package No. 2** | **33 days** | **7/30/2019** | **9/16/2019** |
| 177 | Submit Advertisement to Central Register and Newspaper | 0 days | 7/30/2019 | 7/30/2019 |
| 178 | Notice in Central Register | 0 days | 8/7/2019 | 8/7/2019 |
| 179 | Issue Early Foundation and Structural Package Bid Documents | 0 days | 8/9/2019 | 8/9/2019 |
| 180 | PreBid Meeting | 0 days | 8/19/2019 | 8/19/2019 |
| 181 | Trade Contractor Bids Due | 0 days | 8/26/2019 | 8/26/2019 |
| 182 | Concrete and Steel Contractor Bids Due | 0 days | 8/30/2019 | 8/30/2019 |
| 183 | Descoping and Development of GMP Amendment | 10 days | 8/30/2019 | 9/13/2019 |
| 184 | Award Early Foundation and Structural Package GMP | 0 days | 9/16/2019 | 9/16/2019 |

Updated September 27, 2019

City of Framingham
New Fuller Middle School
Project Schedule

PROJECT MANAGEMENT SMMA

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 185 | **Early Masonry Package No. 3** | **25 days** | **10/8/2019** | **11/12/2019** |
| 186 | Submit Advertisement to Central Register and Newspaper | 0 days | 10/8/2019 | 10/8/2019 |
| 187 | Notice in Central Register | 0 days | 10/16/2019 | 10/16/2019 |
| 188 | Issue Early Masonry Package Bid Documents | 0 days | 10/18/2019 | 10/18/2019 |
| 189 | PreBid Meeting | 0 days | 10/22/2019 | 10/22/2019 |
| 190 | Trade Contractor Bids Due | 0 days | 11/8/2019 | 11/8/2019 |
| 191 | Award Early Masonry Package GMP | 0 days | 11/12/2019 | 11/12/2019 |
| 192 | **CONSTRUCTION** | **737 days** | **6/10/2019** | **4/21/2022** |
| 193 | Notice to Proceed | 0 days | 6/18/2019 | 6/18/2019 |
| 194 | EPA NPDES Submitted | 0 days | 6/10/2019 | 6/10/2019 |
| 195 | EPA NPDES Approved | 0 days | 6/24/2019 | 6/24/2019 |
| 196 | Site Mobilization | 0 days | 6/20/2019 | 6/20/2019 |
| 197 | MA DEP RAM Plan Submitted | 0 days | 7/17/2019 | 7/17/2019 |
| 198 | **Substantial Completion - Phase 1 "Enabling Work"** | **0 days** | **8/20/2019** | **8/20/2019** |
| 199 | 50% DCAMM Evaluation | 0 days | 8/15/2020 | 8/15/2020 |
| 200 | Punch List Start | 0 days | 4/15/2021 | 4/15/2021 |
| 201 | Punch List Complete | 0 days | 6/15/2021 | 6/15/2021 |
| 202 | **Substantial Completion - Phase 2 "Building Construction"** | **0 days** | **6/15/2021** | **6/15/2021** |
| 203 | Final Completion, Closeout and Commissioning | 34 days | 6/15/2021 | 7/30/2021 |
| 204 | FFE/Technology Installation | 34 days | 6/15/2021 | 7/30/2021 |
| 205 | Teacher/Staff Move-In | 21 days | 8/2/2021 | 8/30/2021 |
| 206 | **Occupancy** | **0 days** | **8/30/2021** | **8/30/2021** |
| 207 | Abate and Demolish Existing School | 67 days | 7/3/2021 | 10/5/2021 |
| 208 | Parking Lot and Playfield Construction | 55 days | 10/4/2021 | 12/20/2021 |
| 209 | CM Request for Final Payment | 0 days | 12/20/2021 | 12/20/2021 |
| 210 | **Substantial Completion - Phase 3 "Demolition and Site Work"** | **0 days** | **12/20/2021** | **12/20/2021** |
| 211 | Closeout | 46 days | 12/20/2021 | 2/21/2022 |
| 212 | Final Completion | 46 days | 12/20/2021 | 2/21/2022 |
| 213 | 100% DCAMM Evaluation | 0 days | 2/21/2022 | 2/21/2022 |
| 214 | LEED-S Construction Submission | 46 days | 12/20/2021 | 2/21/2022 |
| 215 | MSBA Final Payment Reimbursement Request | 0 days | 3/1/2022 | 3/1/2022 |
| 216 | Commissioning Agent 10-month Inspection | 0 days | 4/15/2022 | 4/15/2022 |
| 217 | Commissioning Agent Final Report Submission to MSBA | 0 days | 4/15/2022 | 4/15/2022 |
| 218 | Commissioning Agent Submission of Certification | 0 days | 4/15/2022 | 4/15/2022 |
| 219 | USGBC Issuance of Certification | 0 days | 4/21/2022 | 4/21/2022 |



## 2.3 Scope and Budget

### 2.3.1 Project Budget

The Project Budget for the New Fuller Middle School is $98,276,878 as defined in the Project Funding Agreement. The project is on budget, as shown on the Total Project Budget Form, inclusive of the Reconciled Construction Cost Estimate, appended at the end of this section.

The Construction Budget is $77,935,429. The 90% Construction Documents Estimate provided by Consigli Construction Co., Inc., dated October 7, 2019, is currently tracking on budget at $77,393,464 and as defined by the Cost Estimate Comparison Spreadsheet appended at the end of this section.

Three independent 90% Construction Documents Estimates were prepared. The estimates, prepared by A.M. Fogarty, dated September 26, 2019; Miyakoda Consulting, dated September 30, 2019 and Consigli Construct Co., Inc., dated September 27, 2019, were reconciled with each other through an intensive series of review meetings with the entire design team, the OPM and the estimators. The estimates and the Draft Cost Estimate Comparison Spreadsheet are appended at the end of this section.

Value Engineering was performed with the School Building Committee (SBC) on October 7, 2019, meeting minutes attached. The following Value Engineering items were approved:

1. Change Learning Commons Porcelain Tile to Linoleum – Deduct $112,000

The approved value engineering item will be incorporated into the 100% Construction Documents and Estimate.

SMMA

Project Management

# Project Minutes

| | | | |
|---|---|---|---|
| Project: | New Fuller Middle School | Project No.: | 17050 |
| Prepared by: | Joel Seeley | Meeting Date: | 10/7/19 |
| Re: | School Building Committee Meeting | Time: | 7:00pm |
| Location: | Fuller Middle School Library | Meeting No: | 49 |
| Distribution: | Attendees (MF) | | |

Attendees

| PRESENT | NAME | AFFILIATION | VOTING MEMBER |
|---|---|---|---|
| ✓ | David Miles | Co-Chair, City Resident with Experience in Finance | **Voting Member** |
| | Dr. Edward Gotgart | Co-Chair | Non-Voting Member |
| | Mayor Spicer | Mayor, Chief Executive Officer | Non-Voting Member |
| | Thatcher Kezer III | Chief Operating Officer | Non-Voting Member |
| ✓ | Richard Finlay | School Committee Member and Convener | **Voting Member** |
| ✓ | Adam Freudberg | Chair, School Committee | **Voting Member** |
| | Charlie Sisitsky | City Council Member | **Voting Member** |
| ✓ | Richard Weader II | Member of community with arch., eng., and/or const. experience | **Voting Member** |
| ✓ | Michael Grilli | Member of community with arch., eng., and/or const. experience | **Voting Member** |
| ✓ | Cynthia Blackwell | School Building Committee Member | **Voting Member** |
| ✓ | Dr. Jennifer Krusinger Martin | School Building Committee Member | **Voting Member** |
| ✓ | Donald C. Taggart III | City Resident/Retired Teacher | **Voting Member** |
| | Jennifer Pratt | Assistant Chief Financial Officer and SBC Member who is MCPPO certified | Non-Voting Member |
| | Dr. Robert Tremblay | Superintendent of Schools | Non-Voting Member |
| ✓ | Matt Torti | Director of Buildings and Grounds | Non-Voting Member |
| | Kerry Wood | Principal, Fuller Middle School | Non-Voting Member |
| ✓ | Anne Ludes | Director of Secondary Education | Non-Voting Member |
| | Mary Ellen Kelley | Chief Financial Officer and Local Budget official or member of Finance Committee | Non-Voting Member |
| | Michael Tusino | Certified Building Official | Non-Voting Member |
| | Patrick Johnson | Principal, Walsh Middle School | Non-Voting Member |
| ✓ | David Panich | School Building Committee Member | Non-Voting Member |
| | Thomas Barbieri | School Building Committee Member | Non-Voting Member |
| | Noval Alexander | School Committee Member | Non-Voting Member |
| | Heather Connolly | Former Chair of the School Committee | Non-Voting Member |
| ✓ | Scott Wadland | School Committee Member | |
| ✓ | Michael Stevens | Assistant Principal, Fuller Middle School | |
| ✓ | Jonathan Levi | JLA, Architect | |
| ✓ | Philip Gray | JLA, Architect | |
| | Elizabeth Bugbee | JLA, Architect | |
| | Christian Riordan | Consigli Construction Company (CCC), CM | |
| ✓ | Matteo Batista | Consigli Construction Company (CCC), CM | |
| | Kristy Lyons | Consigli Construction Company (CCC), CM | |
| ✓ | Robert Smith | SMMA, OPM | |
| ✓ | Joel Seeley | SMMA, OPM | |

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Cambridge, MA 02138
617.547.5400

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| Item # | Action | Discussion |
|---|---|---|
| 49.1 | Record | Call to Order, 7:00 PM, meeting opened. |
| 49.2 | Record | D. Miles indicated S. Wadland will be voting for A. Freudberg upon his departure as the School Committee representative. |
| 49.3 | Record | Public Comments - none |
| 49.4 | Record | A motion was made by R. Finlay and seconded by M. Grilli to approve the 9/16/19 School Building Committee meeting minutes, attached. No discussion, motion passed unanimous by those attending. |
| 49.5 | Record | J. Seeley distributed and reviewed the Budget Tracking Form thru 9/30/19, attached, for the Total Project Budget |
| 49.6 | Record | J. Seeley distributed and reviewed Warrant No. 23, attached.<br>A motion was made by R. Finlay and seconded by M. Grilli to approve Warrant No. 23. No discussion, motion passed unanimous. |
| 49.7 | Record | P. Gray distributed and reviewed Change Order No. 3, dated 10/1/19 in the amount of $291.12, Change Order Description Form and Change Order Contingency Summary Form, all attached.<br>A motion was made by R. Finlay and seconded by M. Grilli to approve Change Order No. 3, dated 10/1/19 in the amount of $291.12 and recommend signature by T. Kezer III. No discussion, motion passed unanimous. |
| 49.8 | Record | J. Seeley distributed and reviewed the updated 90% Construction Document Phase Meetings and Agenda Schedule, the updated 100% Construction Document Phase Meetings and Agenda Schedule, and the updated Project Schedule, attached. |
| 49.9 | J. Levi | J. Levi to coordinate with the Principal on a presentation of the project to the Fuller teachers and staff, targeted for September or October. *(Item from Prior Meeting)* |
| 49.10 | E. Gotgart | E. Gotgart to be the SBC liaison to the Facilities Subcommittee relative to the School Department and Parks and Recreation joint-sponsored appropriation request, for FY 2022, to the City for upgrading one or both of the Fuller playing fields, or other fields in the City, to synthetic turf fields. *(Item from Prior Meeting)* |
| 49.11 | A. Freudberg | A. Freudberg will follow-up with the School Committee for approval of the supplemental list of Recommended Proprietary Specifications to be included in the project. *(Item from Prior Meeting)* |
| 49.12 | Record | J. Seeley indicated the Public Information Working Group met on 10/7/19 to coordinate community information releases. |
| 49.13 | Record | P. Gray distributed and reviewed the 9/19/19 Door Hardware Meeting minutes, attached. |
| 49.14 | Record | P. Gray provided an overview of the 10/5/19 Neighborhood Meeting, attached. Future neighborhood meetings to be determined. |
| 49.15 | Record | J. Levi presented updated Interior Renderings with three options for the interior painted color accent bands, attached. |

| | | |
|---|---|---|
| | | After discussion, a motion was made by M. Grilli and seconded by A. Freudberg to approve Option A for the Atrium Corridors and Option B for the Classrooms. No discussion, motion passed unanimous. |
| 49.16 | Record | M. Batista presented and reviewed the 90% Construction Documents Construction Cost Estimates, attached. The Consigli estimate reflects a construction cost of $77.4M against a budget of $77.9M. The OPM and Designer estimates were reflecting a lower construction cost. |
| 49.17 | Record | P. Gray presented and reviewed a Bidding Alternate strategy and a bidding alternate to change the Learning Commons porcelain tile flooring to linoleum flooring with an estimated deductive value of $112,000, attached<br><br>Committee Discussion:<br><br>1. D. Miles indicated there is good reason to include bidding alternates, avoiding a project delay in an over budget bid situation<br><br>2. S. Wadland asked how does the bidder bid on the alternate?<br>*J. Levi indicated the Bid Form will have two separate lines, one for the base bid and a second for the alternate.*<br><br>3. C. Blackwell indicated it may be prudent to include additional bidding alternates for bid and market risk.<br>*J. Levi indicated if there are any additional alternates, they will need to be decided by the next Committee meeting to provide JLA sufficient time to include in the contract documents.*<br><br>4. R. Finlay indicated he would like Building and Grounds to provide an opinion on the alternate.<br>*M. Torti indicated if there is a risk of not installing the porcelain tile, then Building and Grounds would not recommend the alternate.*<br><br>A motion was made by S. Wadland and seconded by D. Taggart III to incorporate the following Bidding Alternate into the 100% Construction Documents: 1) change the Learning Commons porcelain tile flooring to linoleum flooring. No discussion, motion passed 7 in favor and 1 against (R. Finlay). |
| 49.18 | Record | A Motion was made by M. Grilli and seconded by R. Finlay to approve the 90% Construction Documents Submittal and authorize submission to the MSBA. No discussion, motion passed unanimous. |
| 49.19 | Record | M. Batista provided a Construction Update, attached. |
| 49.20 | Record | Old or New Business - none |
| 49.21 | Record | Next **SBC Meeting: October 28, 2019 at 7:00 PM** at Fuller Middle School Library. |
| 49.22 | Record | A Motion was made by R. Finlay and seconded by M. Grilli to adjourn the meeting. No discussion, motion passed unanimous. |

Attachments: Agenda, Budget Tracking Form, Warrant No. 23, Change Order No. 3, Description Form and Contingency Summary Form, Updated 90% Construction Document Phase Meetings and Agenda Schedule,

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Updated 100% Construction Document Phase Meetings and Agenda Schedule, Updated Project Schedule Construction Update, 9/19/19 Door Hardware Meeting minutes, Powerpoint

The information herein reflects the understanding reached. Please contact the author if you have any questions or are not in agreement with these Project Minutes.

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### 2.3.2 Total Project Budget

Attached is the updated Total Project Budget.

## Total Project Budget

**City of Framingham**
**Fuller Middle School**
**Updated for 90% Construction Documents Cost Estimate**

**School Building Committee Reviewed on:** **8/27/2018**

| Total Project Budget: All costs associated with the project are subject to 963 CMR 2.16(5) | Estimated Budget | Scope Items Excluded from the Estimated Basis of Maximum Facilities Grant or Otherwise Ineligible | Estimated Basis of Maximum Total Facilities Grant[1] | Estimated Maximum Total Facilities Grant[1] |
|---|---|---|---|---|
| Feasibility Study Agreement | | | | |
| OPM Feasibility Study | $175,000 | $0 | $175,000 | |
| A&E Feasibility Study | $545,000 | $0 | $545,000 | |
| Environmental & Site | $145,000 | $0 | $145,000 | |
| Other | $135,000 | $0 | $135,000 | |
| **Feasibility Study Agreement Subtotal** | **$1,000,000** | **$0** | **$1,000,000** | **$623,100** |
| Administration | | | | |
| Legal Fees | $80,000 | $80,000 | $0 | **$0** |
| **Owner's Project Manager** | | | | |
| Design Development | $175,445 | $284,370 | -$108,925 | |
| Construction Contract Documents | $242,886 | $0 | $242,886 | |
| Bidding | $115,789 | $0 | $115,789 | |
| Construction Contract Administration | $1,727,876 | $0 | $1,727,876 | |
| Closeout | $95,905 | $0 | $95,905 | |
| Extra Services | $40,000 | $0 | $40,000 | |
| Reimbursable & Other Services | $40,000 | $0 | $40,000 | |
| Cost Estimates | $80,000 | $0 | $80,000 | |
| Advertising | $20,000 | $0 | $20,000 | |
| Permitting | $50,000 | $0 | $50,000 | |
| Owner's Insurance | $120,000 | $0 | $120,000 | |
| Other Administrative Costs | $100,000 | $0 | $100,000 | |
| **Administration Subtotal** | **$2,887,901** | **$364,370** | **$2,523,531** | **$1,572,412** |
| **Architecture and Engineering** | | | | |
| Basic Services | | | | |
| Design Development | $2,059,998 | $832,109 | $1,227,889 | |
| Construction Contract Documents | $2,746,664 | $0 | $2,746,664 | |
| Bidding | $137,334 | $0 | $137,334 | |
| Construction Contract Administration | $1,833,398 | $0 | $1,833,398 | |
| Closeout | $89,265 | $0 | $89,265 | |
| Other Basic Services | $0 | $0 | $0 | |
| **Basic Services Subtotal** | **$6,866,659** | **$832,109** | **$6,034,550** | |
| Reimbursable Services | | | | |
| Construction Testing | $30,000 | $0 | $30,000 | |
| Printing (over minimum) | $20,000 | $0 | $20,000 | |
| Other Reimbursable Costs | $180,000 | $0 | $180,000 | |
| Hazardous Materials | $170,984 | $0 | $170,984 | |
| Geotechnical & Geo-Environmental | $155,925 | $0 | $155,925 | |
| Site Survey | $44,000 | $0 | $44,000 | |
| Wetlands | $44,000 | $0 | $44,000 | |
| Traffic Studies | $38,500 | $0 | $38,500 | |
| **Architectural/Engineering Subtotal** | **$7,550,068** | **$832,109** | **$6,717,959** | **$4,185,960** |
| **CM at Risk Preconstruction Services** | | | | |
| Pre-Construction Services | $400,000 | **$0** | $400,000 | **$249,240** |
| Site Acquisition | | | | |
| Land / Building Purchase | $0 | $0 | $0 | |
| Appraisal Fees | $0 | $0 | $0 | |
| Recording fees | $0 | $0 | $0 | |
| **Site Acquisition Subtotal** | **$0** | **$0** | **$0** | **$0** |

## Total Project Budget

**City of Framingham**
**Fuller Middle School**
**Updated for 90% Construction Documents Cost Estimate**

**School Building Committee Reviewed on:** **8/27/2018**

| Total Project Budget: All costs associated with the project are subject to 963 CMR 2.16(5) | Estimated Budget | Scope Items Excluded from the Estimated Basis of Maximum Facilities Grant or Otherwise Ineligible | Estimated Basis of Maximum Total Facilities Grant[1] | Estimated Maximum Total Facilities Grant[1] |
|---|---|---|---|---|
| Construction Costs | | | | |
| SUBSTRUCTURE | | | | |
| Foundations | $1,634,809 | $0 | | |
| Basement Construction | $0 | $0 | | |
| SHELL | | | | |
| SuperStructure | $6,055,836 | $0 | | |
| Exterior Closure | $0 | $0 | | |
| Exterior Walls | $5,081,958 | $0 | | |
| Exterior Windows | $1,676,839 | $0 | | |
| Exterior Doors | $167,968 | $0 | | |
| Roofing | $2,375,388 | $0 | | |
| INTERIORS | | | | |
| Interior Construction | $7,235,868 | $0 | | |
| Staircases | $408,160 | $0 | | |
| Interior Finishes | $5,102,211 | $0 | | |
| SERVICES | | | | |
| Conveying Systems | $220,450 | $0 | | |
| Plumbing | $2,094,999 | $0 | | |
| HVAC | $8,064,951 | $0 | | |
| Fire Protection | $873,859 | $0 | | |
| Electrical | $5,196,978 | $0 | | |
| EQUIPMENT & FURNISHINGS | | | | |
| Equipment | $1,671,288 | $0 | | |
| Furnishings | $1,533,465 | $0 | | |
| SPECIAL CONSTRUCTION & DEMOLITION | | | | |
| Special Construction | $0 | $0 | | |
| Existing Building Demolition | $1,367,800 | $0 | | |
| In-Building Hazardous Material Abatement | $1,213,480 | | | |
| Asbestos Containing Floor Material Abatement | $388,800 | $388,800 | | |
| Other Hazardous Material Abatement | $0 | $0 | | |
| BUILDING SITEWORK | | | | |
| Site Preparation | $4,746,798 | $6,674,478 | | |
| Site Improvements | $4,201,267 | $0 | | |
| Site Civil / Mechanical Utilities | $1,025,389 | $0 | | |
| Site Electrical Utilities | $652,626 | $0 | | |
| Other Site Construction | $0 | $0 | | |
| Scope Excluded Site Cost | | $0 | | |
| **Construction Trades Subtotal** | $62,991,187 | $7,063,278 | | |
| Contingencies (Design and Pricing) | $1,416,139 | $158,793 | | |
| General Conditions | $3,988,224 | $447,204 | | |
| General Requirments | $3,084,502 | $345,869 | | |
| Insurance | $895,218 | $100,382 | | |
| Bonds | $1,320,945 | $148,119 | | |
| GMP Fee | $1,560,000 | $174,925 | | |
| not used | | $0 | | |
| GMP Contingency | $1,651,041 | $185,133 | | |
| Escalation to Mid-Point of Construction | $486,208 | $54,519 | | |
| Ineligible Auditorium & PE Areas beyond Guidelines | | $7,213,734 | | |
| Overall Excluded Construction Cost | | $13,683,070 | | |
| **Construction Budget** | **$77,393,464** | **$29,575,027** | **$47,818,437** | **$29,795,668** |
| Alternates | | | | |
| | $0 | | $0 | |
| Alternates Included in the Total Project Budget | $0 | $0 | $0 | |
| Alternates Excluded from the Total Project Budget | $0 | | $0 | |
| **Subtotal to be Included in Total Project Budget** | **$0** | **$0** | **$0** | **$0** |
| Miscellaneous Project Costs | | | | |
| Utility Company Fees | $280,000 | $0 | $280,000 | |
| Testing Services | $300,000 | $0 | $300,000 | |
| Swing Space / Modulars | $0 | $0 | $0 | |
| Other Project Costs (Mailing & Moving) | $200,000 | $200,000 | $0 | |
| **Misc. Project Costs Subtotal** | **$780,000** | **$200,000** | **$580,000** | **$361,398** |
| Furnishings and Equipment | | | | |
| Furniture, Fixtures, and Equipment | $1,134,000 | $378,000 | $756,000 | |
| Technology | $1,134,000 | $378,000 | $756,000 | |
| **FF&E Subtotal** | **$2,268,000** | **$756,000** | **$1,512,000** | **$942,127** |
| | | | | |
| Soft Costs that exceed 20% of Construction Cost | | $0 | | |

# Total Project Budget

**City of Framingham**
**Fuller Middle School**
**Updated for 90% Construction Documents Cost Estimate**

**School Building Committee Reviewed on:** **8/27/2018**

| Total Project Budget: All costs associated with the project are subject to 963 CMR 2.16(5) | Estimated Budget | Scope Items Excluded from the Estimated Basis of Maximum Facilities Grant or Otherwise Ineligible | Estimated Basis of Maximum Total Facilities Grant[1] | Estimated Maximum Total Facilities Grant[1] |
|---|---|---|---|---|
| **Project Budget** | **$92,279,433** | **$31,727,506** | **$60,551,927** | **$37,729,906** |

| **Board Authorization** | |
|---|---|
| Design Enrollment | 630 |
| Total Building Gross Floor Area (GSF) | 136,790 |
| Total Project Budget (excluding Contingencies) | $92,279,433 |
| Scope Items Excluded or Otherwise Ineligible | $31,727,506 |
| Third Party Funding (Ineligible) | $0 |
| Estimated Basis of Maximum Total Facilities Grant[1] | $60,551,927 |
| Reimbursement Rate[3, 4] | 62.31% |
| Est. Max. Total Facilities Grant (before recovery)[1] | $37,729,906 |
| Cost Recovery[5] | $0 |
| Estimated Maximum Total Facilities Grant[1] | $37,729,906 |

| | |
|---|---|
| Construction Contingency[2] | $4,438,736 |
| Ineligible Construction Contingency[2] | $3,664,801 |
| "Potentially Eligible" Construction Contingency[2] | $773,935 |
| Owner's Contingency[2] | $1,558,709 |
| Ineligible Owner's Contingency[2] | $0 |
| "Potentially Eligible" Owner's Contingency[2] | $1,558,709 |
| Total Potentially Eligible Contingency[2] | $2,332,644 |
| Reimbursement Rate[3, 4] | 62.31% |
| Potential Additional Contingency Grant Funds[2] | $1,453,470 |
| Maximum Total Facilities Grant | $39,183,376 |
| Total Project Budget | $98,276,878 |

| | |
|---|---|
| 57.83 | Reimbursement Rate Before Incentive Points |
| 4.48 | Total Incentive Points[3, 4] |
| 62.31% | MSBA Reimbursement Rate |

NOTES

This template was prepared by the MSBA as a tool to assist Districts and consultants in understanding MSBA policies and practices regarding potential impact on the MSBA's calculation of a potential Basis of Total Facilities Grant and potential Total Maximum Facilities Grant. This template does not contain a final, exhaustive list of all evaluations which the MSBA may use in determining whether items are eligible for reimbursement by the MSBA. The MSBA will perform an independent analysis based on a review of information and estimates provided by the District for the proposed school project that may or may not agree with the estimates generated by the District using this template.

1. Does not include any potentially eligible contingency funds and is subject to review and audit by the MSBA.
2. The proposed demolition of the _____ School is expected to result in the MSBA recovering a portion of state funds previously paid to the District for the ____ project at the existing facilities completed in ___. The MSBA will perform an independent analysis based on a review of information and estimates provided by the District for the proposed school project that may or may not agree with the estimated cost recovery generated by the District and its consultants using this template.
3. Pursuant to Section 3.20 of the Project Funding Agreement and the applicable policies and guidelines of the Authority, any project costs associated with the reallocation or transfer of funds from either the Owner's contingency or the Construction contingency to other budget line items shall be subject to review by the Authority to determine whether any such costs are eligible for reimbursement by the Authority. All costs are subject to review and audit by the MSBA.

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

_____

By:
Title: Chair of School Building Committee

Date: _____

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

_____

By:
Title: Chief Executive Officer

Date: _____

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

_____

By:
Title: Superintendent of Schools

Date: _____

By signing this Total Project Budget, I hereby certify that I have read and understand the form and further certify, to the best of my knowledge and belief, that the information supplied by the District in the table above is true, accurate, and complete.

_____

By:
Title: Chair of School Committee

Date: _____

P:\2017\17050\03-DESIGN\3.4 Submissions\6-90% CD Submission\OPM Deliverables\Dont Send\[Total Project Budget - Schematic Design Submission-updated 9-19-18 updated to 90% CD Estiamte.xlsx]PS and B TPB

### 2.3.3 Construction Estimate Comparison

Attached is the updated Construction Cost Comparison.

**Framingham**
**New Fuller Middle School**
**Final 90% CD Construction Estimate Comparison**

PROJECT MANAGEMENT SMMA

Dated 10/9/19

| | Consigli Final 60% CD Estimate 8/5/19 | | Consigli Final 90% CD Estimate 10/7/19 | | Delta from Final 60% Estimate | Myakoda FInal 90% CD Estimate 10/9/19 | | Delta from Final 60% Estimate | Fogarty Draft 90% CD Estimate 10/9/19 | | Delta from Final 60% Estimate |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SF | 136,790 | | 136,790 | | | 136,790 | | | 136,790 | | |
| Division 1 - General Requirements | $ 75,000 | | $ 75,000 | | $ - | $ - | | $ (75,000) | $ 75,000 | | $ - |
| Division 2 - Existing Conditions | $ 2,872,380 | | $ 2,970,080 | | $ 97,700 | $ 2,759,990 | | $ (112,390) | $ 2,970,080 | | $ 97,700 |
| Division 3 - Concrete | $ 2,772,478 | | $ - | | $ (2,772,478) | $ 45,648 | | $ (2,726,830) | $ - | | $ (2,772,478) |
| Division 4 - Masonry | $ 2,015,845 | | $ 2,290,785 | | $ 274,940 | $ 2,338,257 | | $ 322,412 | $ 2,296,962 | | $ 281,117 |
| Division 5 - Metals | $ 5,438,115 | | $ 1,112,650 | | $ (4,325,465) | $ 836,941 | | $ (4,601,174) | $ 1,162,710 | | $ (4,275,405) |
| Division 6 - Wood, Plastics and Composites | $ 2,101,375 | | $ 1,929,625 | | $ (171,750) | $ 1,781,230 | | $ (320,145) | $ 2,078,706 | | $ (22,669) |
| Division 7 - Thermal and Moisture Protection | $ 3,789,139 | | $ 3,839,458 | | $ 50,319 | $ 3,738,916 | | $ (50,223) | $ 3,905,896 | | $ 116,757 |
| Division 8 - Openings | $ 4,382,132 | | $ 4,265,650 | | $ (116,482) | $ 4,302,558 | | $ (79,574) | $ 4,024,611 | | $ (357,521) |
| Division 9 - Finishes | $ 7,991,673 | | $ 9,107,876 | | $ 1,116,203 | $ 8,912,813 | | $ 921,140 | $ 8,645,689 | | $ 654,016 |
| Division 10 - Specialties | $ 1,087,728 | | $ 1,170,442 | | $ 82,714 | $ 1,286,280 | | $ 198,552 | $ 1,083,401 | | $ (4,327) |
| Division 11 - Equipment | $ 1,431,329 | | $ 1,428,829 | | $ (2,500) | $ 1,683,448 | | $ 252,119 | $ 1,492,662 | | $ 61,333 |
| Division 12 - Furnishings | $ 668,465 | | $ 642,675 | | $ (25,790) | $ 540,232 | | $ (128,233) | $ 654,764 | | $ (13,701) |
| Division 13 - Special Construction | $ - | | $ - | | $ - | $ - | | $ - | $ - | | $ - |
| Division 14 - Conveying Equipment | $ 220,000 | | $ 220,000 | | $ - | $ 215,000 | | $ (5,000) | $ 212,000 | | $ (8,000) |
| Division 21 - Fire Suppression | $ 791,653 | $6 | $ 873,859 | $6 | $ 82,206 | $ 962,994 | $7 | $ 171,341 | $ 893,565 | $7 | $ 101,912 |
| Division 22 - Plumbing | $ 2,195,545 | $16 | $ 2,033,274 | $15 | $ (162,271) | $ 2,126,673 | $16 | $ (68,872) | $ 2,150,852 | $16 | $ (44,693) |
| Division 23 - HVAC | $ 7,967,908 | $58 | $ 8,126,676 | $59 | $ 158,768 | $ 7,879,869 | $58 | $ (88,039) | $ 8,247,841 | $60 | $ 279,933 |
| Division 26 - Electrical | $ 5,663,400 | $41 | $ 5,773,794 | $42 | $ 110,394 | $ 5,893,015 | $43 | $ 229,615 | $ 6,000,049 | $44 | $ 336,649 |
| Division 31 - Earthwork | $ - | | $ - | | $ - | $ - | | $ - | $ - | | $ - |
| Division 32 - Exterior Improvements | $ 1,605,665 | | $ 1,340,457 | | $ (265,208) | $ 1,401,720 | | $ (203,945) | $ 1,353,932 | | $ (251,733) |
| Division 33 - Utilities | $ - | | $ 3,500 | | $ 3,500 | $ - | | $ - | $ - | | $ - |
| | | $ 53,069,830 $388 | | $ 47,204,630 $345 | -$5,865,200 | | $ 46,705,584 $341 | -$6,364,246 | | $ 47,248,720 $345 | -$5,821,110 |
| Total Trade Cost | | $ 53,069,830 | | $ 47,204,630 | | | $ 46,705,584 | | | $ 47,248,720 | |
| General Conditions | $ 3,401,447 | | $ 2,931,033 | | -$470,414 | $ 2,931,033 | | -$470,414 | $ 2,931,033 | | -$470,414 |
| General Requirements | $ 2,652,482 | | $ 2,289,380 | | -$363,102 | $ 2,289,380 | | -$363,102 | $ 2,289,380 | | -$363,102 |
| Insurance | $ 668,571 | | $ 576,109 | | -$92,462 | $ 576,109 | | -$92,462 | $ 576,109 | | -$92,462 |
| Bonds | $ - | | $ - | | $0 | $ - | | $0 | $ - | | $0 |
| Sub Bonds | $ 742,977 | | $ 660,865 | | -$82,112 | $ 672,892 | | -$70,085 | $ 265,000 | | -$477,977 |
| Builders Risk | $ - | | $ - | | $0 | $ - | | $0 | $ - | | $0 |
| Permit | $ - | | $ - | | $0 | $ - | | $0 | $ - | | $0 |
| Fee | $ 1,337,143 | | $ 1,152,218 | | -$184,925 | $ 1,152,218 | | -$184,925 | $ 1,152,218 | | -$184,925 |
| Design Contingency | $ 2,653,491 | | $ 1,416,139 | 3% | -$1,237,352 | $ 1,401,168 | 3% | -$1,252,323 | $ 1,417,462 | 3% | -$1,236,029 |
| GMP Contingency | $ 1,432,554 | | $ 1,244,196 | | -$188,358 | $ 1,376,431 | | -$56,123 | $ 1,216,655 | | -$215,899 |
| Escalation | $ 835,850 | | $ 486,208 | 1% | -$349,642 | $ 481,068 | 1% | -$354,782 | $ 498,828 | 1% | -$337,022 |
| | | $ 13,724,515 | | $ 10,756,148 | -$2,968,367 | | $ 10,880,299 | -$2,844,216 | | $ 10,346,685 | -$3,377,830 |
| Early Site Package | | $ 10,957,843 | | $ 10,957,843 | $0 | | $ 10,957,843 | $0 | | $ 10,957,843 | $0 |
| Early Concrete and Steel Package | | | | $ 8,738,800 | $8,738,800 | | $ 8,738,800 | $8,738,800 | | $ 8,738,800 | $8,738,800 |
| Buy Savings | | | | $ (50,755) | -$50,755 | | $ (50,755) | -$50,755 | | $ (50,755) | -$50,755 |
| Total Construction Cost | | $ 77,752,188 $568 | | $ 77,606,666 $567 | -$145,522 | | $ 77,231,771 $565 | -$520,417 | | $ 77,241,293 $565 | -$510,895 |
| Post 60% VE ** | | $ (487,000) | | $ (213,200) | | | | | | | |
| Adjusted Cost | | $ 77,265,188 | | $ 77,393,466 | $128,278 | | $ 77,231,771 | -$33,417 | | $ 77,241,293 | -$23,895 |
| Construction Cost Budget | | $ 77,935,429 | | $ 77,935,429 | | | $ 77,935,429 | | | $ 77,935,429 | |
| Delta | | $ (670,241) | | $ (541,963) | | | $ (703,658) | | | $ (694,136) | |

**

Remove the raised traffic table on Flagg Drive – Deduct $247,000
Remove the stepped terraces on the amphitheater – Deduct $139,000
Change the Centralized pH Neutralization System to a point of use system – Deduct $101,000

### 2.3.4 Reconciled Cost Estimate - CMR

Attached is the reconciled CMR Cost Estimate.

# 90% CD **Reconciled** Estimate

CONSIGLI
Est. 1905

**Town of Framingham**
Fuller Middle School
Framingham, MA
October 7, 2019

**SUBMITTED BY:**

Consigli Construction Co., Inc.
72 Sumner Street
Milford, MA 01757

# TABLE OF CONTENTS

Fuller Middle School

CONSIGLI
Est. 1905

## The Right Choice

Consigli Construction Co., Inc. is a fourth-generation family owned organization that can offer the resources and experience of one of the strongest construction management firms in the Northeast with the creativity and flexibility of a start-up.

CONSIGLI

*Est. 1905*

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **A Substructure** | | | |
| A10 Foundations | | | |
| A1010 Standard Foundations | 136,600 sf | /sf | |
| A1030 Slab on Grade | 136,600 sf | /sf | |
| A10 Foundations | 136,600 sf | /sf | |
| **A Substructure** | **136,600 sf** | **/sf** | |
| **B Shell** | | | |
| B10 Superstructure | | | |
| B1010 Floor Construction | 136,600 sf | 1.55 /sf | 211,720 |
| B1020 Roof Construction | 136,600 sf | 1.39 /sf | 190,225 |
| B10 Superstructure | 136,600 sf | 2.94 /sf | 401,945 |
| B20 Exterior Enclosure | | | |
| B2010 Exterior Walls | 136,600 sf | 37.20 /sf | 5,081,958 |
| B2020 Exterior Windows | 136,600 sf | 12.28 /sf | 1,676,839 |
| B2030 Exterior Doors | 136,600 sf | 1.23 /sf | 167,968 |
| B20 Exterior Enclosure | 136,600 sf | 50.71 /sf | 6,926,765 |
| B30 Roofing | | | |
| B3010 Roof Coverings | 136,600 sf | 12.32 /sf | 1,682,388 |
| B3020 Roof Openings | 136,600 sf | 5.07 /sf | 693,000 |
| B30 Roofing | 136,600 sf | 17.39 /sf | 2,375,388 |
| **B Shell** | **136,600 sf** | **71.04 /sf** | **9,704,098** |
| **C Interiors** | | | |
| C10 Interior Construction | | | |
| C1010 Partitions | 136,600 sf | 38.28 /sf | 5,228,988 |
| C1020 Interior Doors | 136,600 sf | 7.23 /sf | 987,898 |
| C1030 Specialties/Millwork | 136,600 sf | 7.46 /sf | 1,018,982 |
| C10 Interior Construction | 136,600 sf | 52.97 /sf | 7,235,868 |
| C20 Stairs | | | |
| C2010 Stair Construction | 136,600 sf | 2.87 /sf | 392,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| C2020 Stair Finishes | 136,600 sf | 0.12 /sf | 16,160 |
| C20 Stairs | 136,600 sf | 2.99 /sf | 408,160 |
| C30 Interior Finishes | | | |
| C3010 Wall Finishes | 136,600 sf | 11.51 /sf | 1,571,556 |
| C3020 Floor Finishes | 136,600 sf | 8.76 /sf | 1,196,940 |
| C3030 Ceiling Finishes | 136,600 sf | 17.08 /sf | 2,333,715 |
| C30 Interior Finishes | 136,600 sf | 37.35 /sf | 5,102,210 |
| **C Interiors** | **136,600 sf** | **93.31 /sf** | **12,746,238** |
| **D Services** | | | |
| D10 Conveying Systems | | | |
| D1010 Elevators & Lifts | 136,600 sf | 1.61 /sf | 220,450 |
| D10 Conveying Systems | 136,600 sf | 1.61 /sf | 220,450 |
| D20 Plumbing | | | |
| D2010 Plumbing | 136,600 sf | 3.62 /sf | 494,156 |
| D2020 Domestic Water Distribution | 136,600 sf | 3.96 /sf | 540,525 |
| D2030 Sanitary Waste | 136,600 sf | 2.51 /sf | 343,448 |
| D2040 Rain Water Drainage | 136,600 sf | 1.62 /sf | 221,676 |
| D2090 Other Plumbing Systems | 136,600 sf | 3.63 /sf | 495,194 |
| D20 Plumbing | 136,600 sf | 15.34 /sf | 2,094,999 |
| D30 Heating, Ventilating, and Air Conditioning (HVAC) | | | |
| D3010 Energy Supply | 136,600 sf | 9.29 /sf | 1,268,916 |
| D3020 HVAC | 136,600 sf | 1.20 /sf | 163,945 |
| D3030 Cooling Generating Systems | 136,600 sf | 2.85 /sf | 389,905 |
| D3040 HVAC Distribution | 136,600 sf | 18.38 /sf | 2,510,378 |
| D3050 Terminal & Package Units | 136,600 sf | 17.52 /sf | 2,393,325 |
| D3060 HVAC Instrumentation & Controls | 136,600 sf | 5.49 /sf | 749,864 |
| D3070 Testing, Adjusting & Balancing | 136,600 sf | 0.65 /sf | 88,790 |
| D3090 Other HVAC Systems & Equipment | 136,600 sf | 3.66 /sf | 499,829 |
| D30 Heating, Ventilating, and Air Conditioning (HVAC) | 136,600 sf | 59.04 /sf | 8,064,951 |
| D40 Fire Protection Systems | | | |
| D4010 Sprinklers | 136,600 sf | 6.02 /sf | 822,286 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| D4020 Standpipes | 136,600 sf | 0.17 /sf | 22,839 |
| D4030 Fire Protection Specialties | 136,600 sf | 0.08 /sf | 10,734 |
| D4090 Other Fire Protection Systems | 136,600 sf | 0.13 /sf | 18,000 |
| D40 Fire Protection Systems | 136,600 sf | 6.40 /sf | 873,859 |
| D50 Electrical Systems | | | |
| D5010 Gear & Distribution | 136,600 sf | 8.18 /sf | 1,117,861 |
| D5020 Lighting & Branch Wiring | 136,600 sf | 13.46 /sf | 1,838,194 |
| D5030 Communications & Security | 136,600 sf | 12.46 /sf | 1,702,074 |
| D5090 Other Electrical Systems | 136,600 sf | 3.95 /sf | 538,839 |
| D50 Electrical Systems | 136,600 sf | 38.05 /sf | 5,196,968 |
| **D Services** | **136,600 sf** | **120.43 /sf** | **16,451,226** |
| **E Equipment & Furnishings** | | | |
| E10 Equipment | | | |
| E1020 Institutional Equipment | 136,600 sf | 12.06 /sf | 1,646,689 |
| E1090 Other Equipment | 136,600 sf | 0.18 /sf | 24,600 |
| E10 Equipment | 136,600 sf | 12.24 /sf | 1,671,288 |
| E20 Furnishings | | | |
| E2010 Fixed Furnishings | 136,600 sf | 11.23 /sf | 1,533,465 |
| E20 Furnishings | 136,600 sf | 11.23 /sf | 1,533,465 |
| **E Equipment & Furnishings** | **136,600 sf** | **23.46 /sf** | **3,204,754** |
| **F Special Construction & Demolition** | | | |
| F20 Demolition | | | |
| F2010 Building Elements Demolition | 194,500 sf | 7.03 /sf | 1,367,800 |
| F2020 Hazardous Component Abatement | 194,500 sf | 8.24 /sf | 1,602,280 |
| F20 Demolition | 194,500 sf | 15.27 /sf | 2,970,080 |
| **F Special Construction & Demolition** | **194,500 sf** | **15.27 /sf** | **2,970,080** |
| **G Sitework** | | | |
| G10 Site Preparation | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| G1010 Site Clearing | 136,600 sf | /sf | |
| G1020 Site Demolition & Relocations | 136,600 sf | 0.07 /sf | 9,000 |
| G1030 Site Earthwork | 136,600 sf | 3.01 /sf | 410,790 |
| G10 Site Preparation | 136,600 sf | 3.07 /sf | 419,790 |
| G20 Site Improvements | | | |
| G2010 Roadways | 136,600 sf | /sf | |
| G2020 Parking Lots | 136,600 sf | /sf | |
| G2030 Pedestrian Paving | 136,600 sf | 0.14 /sf | 19,265 |
| G2040 Site Development | 136,600 sf | 3.15 /sf | 430,650 |
| G2050 Landscaping | 136,600 sf | 4.99 /sf | 681,702 |
| G20 Site Improvements | 136,600 sf | 8.28 /sf | 1,131,617 |
| G30 Site Civil/Mechanical Utilites | | | |
| G3010 Water Supply | 136,600 sf | /sf | |
| G3020 Sanitary Sewer | 136,600 sf | /sf | |
| G3030 Storm Drainage | 136,600 sf | /sf | |
| G3060 Fuel Distribution | 136,600 sf | /sf | |
| G30 Site Civil/Mechanical Utilites | 136,600 sf | /sf | |
| G40 Site Electrical Utilities | | | |
| G4010 Electrical Distribution | 136,600 sf | 1.22 /sf | 166,498 |
| G4020 Site Lighting | 136,600 sf | 2.57 /sf | 350,530 |
| G4030 Site Communications & Security | 136,600 sf | 0.44 /sf | 59,799 |
| G40 Site Electrical Utilities | 136,600 sf | 4.22 /sf | 576,826 |
| **G Sitework** | **136,600 sf** | **15.58 /sf** | **2,128,233** |

## Estimate Totals

| Description | Amount | Totals | Rate | Cost per Unit |
|---|---|---|---|---|
| Subtotal | **47,204,628** | **47,204,628** | | **345.57 /sf** |
| Design/Estimate Contingency | 1,416,139 | | 3.000 % | 10.37 /sf |
| Escalation | 486,208 | | 1.000 % | 3.56 /sf |
| **Subtotal** | **1,902,347** | **49,106,975** | | **359.49 /sf** |
| SDI (Non-Trade Contracts) | 260,633 | | 1.400 % | 1.91 /sf |
| Sub Bonds (Trade Contracts) | 400,232 | | 1.400 % | 2.93 /sf |
| Contractor's Contingency | 1,244,196 | | 2.500 % | 9.11 /sf |
| General Conditions | 2,931,033 | | | 21.46 /sf |
| General Requirements | 2,289,380 | | | 16.76 /sf |
| **Subtotal** | **7,125,474** | **56,232,449** | | **411.66 /sf** |
| Builder's Risk Insurance - BP1 | | | | |
| General Liability Insurance | 576,109 | | | 4.22 /sf |
| Building Permit - NIC | | | | |
| Performance & Payment Bond | | | | |
| **Subtotal** | **576,109** | **56,808,558** | | **415.88 /sf** |
| Fee | 1,152,218 | | | 8.43 /sf |
| Amendment #1 - Sitework | 10,957,843 | | | 80.22 /sf |
| - Addendum #3: Delete Traffic Table | (195,200) | | | (1.43) /sf |
| - Addendum #3: Reduced Fill at Amphitheater | (18,000) | | | (0.13) /sf |
| Amendment #2 - Concrete & Steel | 8,738,800 | | | 63.97 /sf |
| Amendment #2 - Buy Savings | (50,755) | | | (0.37) /sf |
| **Total** | | **77,393,464** | | **566.57 /sf** |

CONSIGLI

*Est. 1905*

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **A Substructure** | | | |
| **A10 Foundations** | | | |
| **A1010 Standard Foundations** | | | |
| Lull, laborer for cleanup by Consigli (Concrete) | (1) ls | 116,000.00 /ls | (116,000) |
| Trade support - lull, laborer for cleanup (Concrete) | 1 ls | 116,000.00 /ls | 116,000 |
| ***Elevator pit*** | ***BP#2*** | ***/BP#2*** | |
| ***F3 spread footings*** | ***BP#2*** | ***/BP#2*** | |
| ***F4 spread footings*** | ***BP#2*** | ***/BP#2*** | |
| ***F5 spread footings*** | ***BP#2*** | ***/BP#2*** | |
| ***F6 spread footings*** | ***BP#2*** | ***/BP#2*** | |
| ***F7 spread footings*** | ***BP#2*** | ***/BP#2*** | |
| ***F8 spread footings*** | ***BP#2*** | ***/BP#2*** | |
| ***F9 spread footings*** | ***BP#2*** | ***/BP#2*** | |
| ***F10 spread footings*** | ***BP#2*** | ***/BP#2*** | |
| ***F11 spread footings*** | ***BP#2*** | ***/BP#2*** | |
| ***F12 spread footings*** | ***BP#2*** | ***/BP#2*** | |
| ***Continuous footings - 3'x12"*** | ***BP#2*** | ***/BP#2*** | |
| ***Continuous footings - 4'x12"*** | ***BP#2*** | ***/BP#2*** | |
| ***Continuous footings - 5'x12" @ Bandshell*** | ***BP#2*** | ***/BP#2*** | |
| ***Foundation walls - 16"*** | ***BP#2*** | ***/BP#2*** | |
| ***Foundation walls - 16" @ Bandshell*** | ***BP#2*** | ***/BP#2*** | |
| ***Foundation walls - 21"*** | ***BP#2*** | ***/BP#2*** | |
| ***Retaining walls - 16"*** | ***BP#2*** | ***/BP#2*** | |
| ***Concrete walls @ Auditorium*** | ***BP#2*** | ***/BP#2*** | |
| ***Piers - 24"x24"*** | ***BP#2*** | ***/BP#2*** | |
| ***Grade beam 1*** | ***BP#2*** | ***/BP#2*** | |
| ***Grade beam 2*** | ***BP#2*** | ***/BP#2*** | |
| ***Foundation wall insulation*** | ***BP#2*** | ***/BP#2*** | |
| ***Dampproofing at foundation wall*** | ***BP#2*** | ***/BP#2*** | |
| ***Foundation wall waterproofing - membrane w/ drainage board*** | ***BP#2*** | ***/BP#2*** | |
| ***Elevator pit waterproofing - cementitious*** | ***BP#2*** | ***/BP#2*** | |
| ***Site cuts to site fills*** | ***BP#1*** | ***/BP#1*** | |
| ***Excavation @ foundations*** | ***BP#1*** | ***/BP#1*** | |
| ***Fill to subgrade @ building footprint - import (structural fill)*** | ***BP#1*** | ***/BP#1*** | |
| ***Crushed stone base beneath column & wall footings*** | ***BP#1*** | ***/BP#1*** | |
| ***Excavate for elevator pits*** | ***BP#1*** | ***/BP#1*** | |
| ***Dewatering*** | ***BP#1*** | ***/BP#1*** | |
| ***Additional dewatering*** | ***BP#1*** | ***/BP#1*** | |
| ***Site surcharge/rigid inclusion*** | ***BP#1*** | ***/BP#1*** | |
| ***Rammed aggregate piers*** | ***BP#1*** | ***/BP#1*** | |
| ***Rigid inclusions Gym and Auditorium*** | ***BP#1*** | ***/BP#1*** | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **A1010 Standard Foundations** | **136,600 sf** | **/sf** | |
| **A1030 Slab on Grade** | | | |
| ***Slab depressions*** | ***BP#2*** | ***/BP#2*** | |
| ***Slab on grade - 5"*** | ***BP#2*** | ***/BP#2*** | |
| ***Power trowel/seal concrete @ Auditorium*** | ***BP#2*** | ***/BP#2*** | |
| ***Underslab insulation (perimeter only)*** | ***BP#2*** | ***/BP#2*** | |
| ***Crushed stone base beneath S.O.G*** | ***BP#1*** | ***/BP#1*** | |
| ***Fine grade under building*** | ***BP#1*** | ***/BP#1*** | |
| ***Excavate/backfill utilities under SOG by machine*** | ***BP#1*** | ***/BP#1*** | |
| **A1030 Slab on Grade** | **136,600 sf** | **/sf** | |
| **A10 Foundations** | **136,600 sf** | **/sf** | |
| **A Substructure** | **136,600 sf** | **/sf** | |
| **B Shell** | | | |
| **B10 Superstructure** | | | |
| **B1010 Floor Construction** | | | |
| ***Place & finish slabs - 3-1/4" on 3" deck @ floor (LW)*** | ***BP#2*** | ***/BP#2*** | |
| ***Topping slab @ Breakout LGMF floors*** | ***BP#2*** | ***/BP#2*** | |
| ***Moment connections @ floor*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel @ floors*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel hangers - AESS*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel @ floors*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel @ Canopy - AESS*** | ***BP#2*** | ***/BP#2*** | |
| ***Relieving angles @ brick veneer*** | ***BP#2*** | ***/BP#2*** | |
| ***Shoring @ Learning Commons*** | ***BP#2*** | ***/BP#2*** | |
| ***Metal floor decking - galvanized (3" 18g)*** | ***BP#2*** | ***/BP#2*** | |
| ***Metal floor decking @ Breakout room LGMF floors*** | ***BP#2*** | ***/BP#2*** | |
| Sprayed fireproofing - steel beams and columns @ floor structure | 64,740 sf | 3.00 /sf | 194,220 |
| Patch Sprayed fireproofing - floor structure | 5 days | 3,500.00 /days | 17,500 |
| **B1010 Floor Construction** | **136,600 sf** | **1.55 /sf** | **211,720** |
| **B1020 Roof Construction** | | | |
| ***Place & finish slabs - 2-1/2" on 3" deck @ roof*** | ***BP#2*** | ***/BP#2*** | |
| ***Place & finish slabs - 3-1/4" on 3" deck @ roof*** | ***BP#2*** | ***/BP#2*** | |
| ***Moment connections @ roof*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel @ screen wall - galvanized*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel @ roof*** | ***BP#2*** | ***/BP#2*** | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **B1020 Roof Construction** | | | |
| ***Steel dunnage - RTU & chiller*** | ***BP#2*** | ***/BP#2*** | |
| ***Open web joists, bridging*** | ***BP#2*** | ***/BP#2*** | |
| ***Metal roof decking - acoustical (3" 18/16g)*** | ***BP#2*** | ***/BP#2*** | |
| ***Metal roof decking - galvanized (1-1/2" 20g)*** | ***BP#2*** | ***/BP#2*** | |
| ***Metal roof decking - acoustical (1-1/2" 20g)*** | ***BP#2*** | ***/BP#2*** | |
| ***Metal roof decking - galvanized (3" 18g)*** | ***BP#2*** | ***/BP#2*** | |
| Sprayed fireproofing - steel beams and columns @ roof structure below 20' | 33,575 sf | 3.00 /sf | 100,725 |
| Patch Sprayed fireproofing - roof structure | 5 days | 3,500.00 /days | 17,500 |
| Intumescent fireproofing @ Learning Commons | 1 ls | 72,000.00 /ls | 72,000 |
| **B1020 Roof Construction** | **136,600 sf** | **1.39 /sf** | **190,225** |
| **B10 Superstructure** | **136,600 sf** | **2.94 /sf** | **401,945** |
| **B20 Exterior Enclosure** | | | |
| **B2010 Exterior Walls** | | | |
| Exterior wall mockup - Masonry, Allowance | 1 allw | 7,500.00 /allw | 7,500 |
| ***Exterior wall mockup - Steel, Allowance*** | ***BP#2*** | ***/BP#2*** | |
| Exterior wall mockup - Siding, Allowance | 1 allw | 10,000.00 /allw | 10,000 |
| Exterior wall mockup - Waterproofing, Allowance | 1 allw | 5,000.00 /allw | 5,000 |
| Exterior wall mockup - Roofing, Allowance | 1 allw | 2,500.00 /allw | 2,500 |
| Exterior wall mockup - Drywall, Allowance | 1 allw | 10,000.00 /allw | 10,000 |
| Temporary bracing of CMU @ Gym and Auditorium | 1 ls | 100,000.00 /ls | 100,000 |
| Exterior staging | 40,145 sf | 2.50 /sf | 100,363 |
| Masonry winter conditions/heat | 12 wks | 5,000.00 /wks | 60,000 |
| Lull, laborer for cleanup by Consigli (Masonry) | (1) ls | 77,000.00 /ls | (77,000) |
| Lull, laborer for cleanup by Consigli (Waterproofing) | (1) ls | 29,000.00 /ls | (29,000) |
| Lull, laborer for cleanup by Consigli (Siding) | (1) ls | 48,000.00 /ls | (48,000) |
| Trade support - lull, laborer for cleanup (Masonry) | 1 ls | 77,000.00 /ls | 77,000 |
| Trade support - lull, laborer for cleanup (Waterproofing) | 1 ls | 29,000.00 /ls | 29,000 |
| Trade support - lull, laborer for cleanup (Siding) | 1 ls | 48,000.00 /ls | 48,000 |
| ***Precast planters - N/A*** | - | /- | |
| Install loose lintels (< 8") | 14 ea | 150.00 /ea | 2,100 |
| 4x4x12 iron spot brick veneer, scored | 6,105 sf | 36.00 /sf | 219,780 |
| 4x8x8 iron spot brick veneer, scored | 6,750 sf | 36.00 /sf | 243,000 |
| Brick veneer, precast cap @ entry wall per A102A | 25 lf | 285.00 /lf | 7,125 |
| Sill brick/lip brick - Premium | 12,885 sf | 2.00 /sf | 25,770 |
| 4x4x12 scored ground faced CMU veneer | 3,680 sf | 27.00 /sf | 99,360 |
| 4x8x16 scored ground faced CMU veneer | 23,615 sf | 29.00 /sf | 684,835 |
| Sill brick/lip brick - Premium | 27,295 sf | 2.00 /sf | 54,590 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **B2010 Exterior Walls** | | | |
| CMU - 12" exterior wall | 15,795 sf | 25.00 /sf | 394,875 |
| Loose lintels - Furnish | 95 lf | 25.00 /lf | 2,375 |
| Guardrails - 42" galvanized perforated @ exterior | 105 lf | 500.00 /lf | 52,500 |
| Guardrails - 42" galvanized perforated @ terrace | 30 lf | 500.00 /lf | 15,000 |
| Misc. caulking & sealants @ exterior | 73,210 sf | 0.75 /sf | 54,908 |
| Mineral wool insulation at brick/CMU veneer | 40,145 sf | 3.50 /sf | 140,508 |
| Air and vapor barrier @ exterior walls | 56,650 sf | 7.50 /sf | 424,875 |
| Air and vapor barrier @ soffits | 1,245 sf | 7.50 /sf | 9,338 |
| Air and vapor barrier @ phenolic fins per A102A, A315 | 380 sf | 7.50 /sf | 2,850 |
| Corrugated, perforated metal siding @ screen walls | 1,105 sf | 45.00 /sf | 49,725 |
| Exposed fastener metal panel | 6,065 sf | 48.00 /sf | 291,120 |
| Composite metal panel siding | 3,120 sf | 75.00 /sf | 234,000 |
| Phenolic panel siding | 7,705 sf | 80.00 /sf | 616,400 |
| Metal louver | 625 sf | 85.00 /sf | 53,125 |
| Exterior walls - 10" studs, 1/2" sheathing, 5/8" GWB, insulation | 44,220 sf | 23.50 /sf | 1,039,170 |
| Framing @ phenolic fins per A102A, A315 | 380 sf | 7.65 /sf | 2,907 |
| Exterior soffit framing, sheathing, insulation | 1,245 sf | 23.90 /sf | 29,756 |
| Misc. exterior painting | 73,210 sf | 0.50 /sf | 36,605 |
| **B2010 Exterior Walls** | **136,600 sf** | **37.20 /sf** | **5,081,958** |
| **B2020 Exterior Windows** | | | |
| Exterior wall mockup - Windows, Allowance | 1 allw | 20,000.00 /allw | 20,000 |
| Lull, laborer for cleanup by Consigli (Windows) | (1) ls | 73,000.00 /ls | (73,000) |
| Trade support - lull, laborer for cleanup (Windows) | 1 ls | 73,000.00 /ls | 73,000 |
| Window blocking | 7,425 lf | 12.75 /lf | 94,669 |
| Door blocking - exterior | 265 lf | 13.85 /lf | 3,671 |
| Caulking @ storefront/curtainwall | 7,425 lf | 4.00 /lf | 29,700 |
| Window transitions | 7,425 lf | 10.00 /lf | 74,250 |
| Aluminum storefront/windows | 11,555 sf | 100.00 /sf | 1,155,500 |
| Aluminum storefront - School Guard | 545 sf | 140.00 /sf | 76,300 |
| Extruded aluminum perimeter angles | 7,425 lf | 30.00 /lf | 222,750 |
| **B2020 Exterior Windows** | **136,600 sf** | **12.28 /sf** | **1,676,839** |
| **B2030 Exterior Doors** | | | |
| Install exterior door, HW | 14 ea | 300.00 /ea | 4,200 |
| HM doors - exterior flush | 23 lvs | 625.00 /lvs | 14,375 |
| HM frames - exterior single | 5 ea | 255.00 /ea | 1,275 |
| HM frames - exterior double | 9 ea | 440.00 /ea | 3,960 |
| Overhead coiling door | 1 ea | 7,500.00 /ea | 7,500 |
| Aluminum entrance doors, HW - exterior | 4 lvs | 6,000.00 /lvs | 24,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **B2030 Exterior Doors** | | | |
| Aluminum entrance doors, HW - exterior, School Guard | 11 lvs | 7,000.00 /lvs | 77,000 |
| Hardware sets - exterior door/panic | 14 set | 1,920.01 /set | 26,880 |
| Hardware sets - auto operators | 1 set | 4,500.00 /set | 4,500 |
| Install HM door frames - exterior single | 5 ea | 73.00 /ea | 365 |
| Install HM door frames - exterior double | 9 ea | 117.00 /ea | 1,053 |
| Paint HM doors - exerior | 23 lvs | 90.00 /lvs | 2,070 |
| Paint HM frames - exterior, single | 5 ea | 50.00 /ea | 250 |
| Paint HM frames - exterior, double | 9 ea | 60.00 /ea | 540 |
| **B2030 Exterior Doors** | **136,600 sf** | **1.23 /sf** | **167,968** |
| **B20 Exterior Enclosure** | **136,600 sf** | **50.71 /sf** | **6,926,765** |
| **B30 Roofing** | | | |
| **B3010 Roof Coverings** | | | |
| Roof blocking | 5,390 lf | 32.00 /lf | 172,480 |
| PVC membrane roof w/insulation, underlayment, cover board, vapor barrier | 63,155 sf | 19.00 /sf | 1,199,945 |
| Addional layer of protection board | 7,565 sf | 3.00 /sf | 22,695 |
| PVC membrane @ walls | 2,740 sf | 20.25 /sf | 55,485 |
| Reinforced walkway pads | 715 sf | 7.50 /sf | 5,363 |
| Pavers - terrace | 295 sf | 35.00 /sf | 10,325 |
| Pavers - main entrance | 780 sf | 35.00 /sf | 27,300 |
| Roof accessories | 63,155 sf | 0.35 /sf | 22,104 |
| Roof vents & hatches | 1 ls | 25,000.00 /ls | 25,000 |
| Metal roof facia | 2,695 lf | 35.00 /lf | 94,325 |
| Additional flashing, scuppers | 63,155 sf | 0.75 /sf | 47,366 |
| Polycarbonate glazing @ canopy | 440 sf | 150.00 /sf | 66,000 |
| Polycarbonate glazing @ canopy - VM E01 | (440) sf | 150.00 /sf | (66,000) |
| **B3010 Roof Coverings** | **136,600 sf** | **12.32 /sf** | **1,682,388** |
| **B3020 Roof Openings** | | | |
| Metal-framed skylights (8:12) | 4,130 sf | 150.00 /sf | 619,500 |
| Metal-framed skylights gable ends | 490 sf | 150.00 /sf | 73,500 |
| **B3020 Roof Openings** | **136,600 sf** | **5.07 /sf** | **693,000** |
| **B30 Roofing** | **136,600 sf** | **17.39 /sf** | **2,375,388** |
| **B Shell** | **136,600 sf** | **71.04 /sf** | **9,704,098** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **C Interiors** | | | |
| **C10 Interior Construction** | | | |
| **C1010 Partitions** | | | |
| Lull, laborer for cleanup by Consigli (Drywall) | (1) ls | 188,000.00 /ls | (188,000) |
| Trade support - lull, laborer for cleanup (Drywall) | 1 ls | 188,000.00 /ls | 188,000 |
| CMU - 12" interior wall | 6,890 sf | 25.00 /sf | 172,250 |
| CMU - acoustical block, premium | 1,000 sf | 7.50 /sf | 7,500 |
| White CMU - Premium | 1 ls | 75,000.00 /ls | 75,000 |
| White CMU - Premium - VM E02 | (1) ls | 75,000.00 /ls | (75,000) |
| White CMU - Premium - VM E02 | 41,220 sf | 2.00 /sf | 82,440 |
| CMU - ground face block @ exterior, premium - VM E02 | (27,295) sf | 6.00 /sf | (163,770) |
| CMU - ground face block @ interior, premium | 1 ls | 35,000.00 /ls | 35,000 |
| CMU - ground face block @ interior, premium - VM E02 | (1) ls | 35,000.00 /ls | (35,000) |
| CMU - ground face block @ Auditorium, premium - VM E02 | 8,760 sf | 6.00 /sf | 52,560 |
| Light gage metal framing @ Breakout floors | 1,440 sf | 60.00 /sf | 86,400 |
| Light gage metal framing @ Breakout walls | 16,820 sf | 25.00 /sf | 420,500 |
| Misc. metal fabrications | 136,600 sf | 1.50 /sf | 204,900 |
| Seismic clips - 4' OC, each side | 270 ea | 60.00 /ea | 16,200 |
| Support for HVAC enclosure | 1 ls | 40,000.00 /ls | 40,000 |
| ***Steel angles/stantions @ locker guardrail*** | ***BP#2*** | ***/BP#2*** | |
| Handrail @ steps/ramps | 55 lf | 295.00 /lf | 16,225 |
| Cane rails | 120 lf | 200.00 /lf | 24,000 |
| In-wall blocking | 12,160 lf | 12.75 /lf | 155,040 |
| Miscellaneous rough carpentry - Allowance | 136,600 sf | 0.50 /sf | 68,300 |
| Caulking & sealants @ interior | 136,600 sf | 0.90 /sf | 122,940 |
| Firestopping @ rated walls | 5,630 lf | 16.20 /lf | 91,206 |
| Miscellaneous firestopping | 136,600 sf | 0.10 /sf | 13,660 |
| Aluminum storefront - interior, School Guard | 340 sf | 140.00 /sf | 47,600 |
| Aluminum windows - interior, School Guard | 2 ea | 12,000.00 /ea | 24,000 |
| Misc. interior glass & glazing | 136,600 sf | 0.25 /sf | 34,150 |
| Glazed partition | 4,700 sf | 60.00 /sf | 282,000 |
| Glazed partition - double acoustic | 625 sf | 110.00 /sf | 68,750 |
| Glazed partition @ sidelights | 1,165 sf | 75.00 /sf | 87,375 |
| Glass walls @ Breakout | 2,323 sf | 100.00 /sf | 232,300 |
| ***Glass roof @ Breakout - N/A*** | *-* | */-* | |
| Glass roof @ canopy - VM E01 | 82 sf | 150.00 /sf | 12,300 |
| Graduated glass film | 3,675 sf | 5.00 /sf | 18,375 |
| 3M Safety and Security Window Film @ glass walls | 4,090 sf | 15.00 /sf | 61,350 |
| 3M Safety and Security Window Film @ doors | 67 lvs | 450.00 /lvs | 30,150 |
| Level 5 finish - Allowance | 25,000 sf | 2.55 /sf | 63,750 |
| Interior wall framing - 2-1/2" | 3,370 sf | 5.75 /sf | 19,378 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **C1010 Partitions** | | | |
| Interior wall framing - 3-5/8"/4" | 96,355 sf | 5.75 /sf | 554,041 |
| Interior wall framing - 6" | 7,050 sf | 7.65 /sf | 53,933 |
| Interior wall framing - 8" | 21,965 sf | 10.15 /sf | 222,945 |
| Interior wall framing - 10" | 555 sf | 12.10 /sf | 6,716 |
| GWB - 5/8", level 4 | 229,230 sf | 4.15 /sf | 951,305 |
| GWB - 5/8", additional layer | 96,320 sf | 3.50 /sf | 336,627 |
| GWB - high impact | 1 ls | 50,000.00 /ls | 50,000 |
| Shaft liner - 1" | 2,420 sf | 4.15 /sf | 10,043 |
| Sound batt insulation | 137,275 sf | 1.60 /sf | 219,640 |
| Half height walls @ Auditorium | 400 sf | 22.90 /sf | 9,160 |
| LGMF framing @ locker guardrail | 4,095 sf | 5.10 /sf | 20,885 |
| GWB - 5/8", level 5 @ locker guardrail | 4,095 sf | 6.70 /sf | 27,437 |
| Curved walls - premium | 5,205 sf | 6.35 /sf | 33,074 |
| Patch GWB | 136,600 sf | 0.35 /sf | 47,810 |
| Operable partitions w/writeable surface on one side | 325 sf | 77.00 /sf | 25,025 |
| Operable partitions w/writeable surface on both sides | 2,740 sf | 98.00 /sf | 268,520 |
| **C1010 Partitions** | **136,600 sf** | **38.28 /sf** | **5,228,988** |
| **C1020 Interior Doors** | | | |
| Door blocking - interior | 4,965 lf | 13.85 /lf | 68,772 |
| Install interior door, HW | 300 ea | 300.00 /ea | 90,000 |
| HM doors - interior - flush | 45 lvs | 310.00 /lvs | 13,950 |
| HM frames - interior single | 258 ea | 310.00 /ea | 79,980 |
| HM frames - interior single, tandem | 13 ea | 360.00 /ea | 4,680 |
| HM frames - interior double | 29 ea | 385.00 /ea | 11,165 |
| Wood door - interior flush | 297 lvs | 390.00 /lvs | 115,830 |
| Fire rated wood doors - premium | 44 lvs | 390.00 /lvs | 17,160 |
| Acoustical doors (STC 45) - premium | 1 ls | 15,000.00 /ls | 15,000 |
| Access panels | 1 ls | 15,000.00 /ls | 15,000 |
| Coiling security screen - 4' high, manual | 85 sf | 70.00 /sf | 5,950 |
| Coiling security screen - 8' high, manual | 690 sf | 70.00 /sf | 48,300 |
| Custom security gate @ Learning Commons | 2 lvs | 6,000.00 /lvs | 12,000 |
| Aluminum entrance doors, HW - interior | 1 lvs | 6,000.00 /lvs | 6,000 |
| Aluminum entrance doors, HW - interior, School Guard | 8 lvs | 7,000.00 /lvs | 56,000 |
| Hardware sets - standard interior | 287 set | 1,015.00 /set | 291,305 |
| Hardware sets - interior, tandem | 13 set | 1,330.00 /set | 17,290 |
| Automatic operators | 3 pair | 4,400.00 /pair | 13,200 |
| Door glazing - full | 159 ea | 400.00 /ea | 63,600 |
| Door glazing - narrow | 2 ea | 100.00 /ea | 200 |
| Install HM door frames - interior single | 271 ea | 73.00 /ea | 19,783 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **C1020 Interior Doors** | | | |
| Install HM door frames - interior double | 29 ea | 117.00 /ea | 3,393 |
| Paint HM doors - interior | 45 lvs | 90.00 /lvs | 4,050 |
| Paint HM frames - interior, single | 271 ea | 50.00 /ea | 13,550 |
| Paint HM frames - interior, double | 29 ea | 60.00 /ea | 1,740 |
| **C1020 Interior Doors** | **136,600 sf** | **7.23 /sf** | **987,898** |
| **C1030 Specialties/Millwork** | | | |
| Guardrails @ Atrium | 380 lf | 500.00 /lf | 190,000 |
| Perforated architectural grille @ stage front | 120 sf | 200.00 /sf | 24,000 |
| Perforated architectural ceiling grille | 210 sf | 200.00 /sf | 42,000 |
| Window sills - P-lam | 1,100 lf | 25.00 /lf | 27,500 |
| Wood louvered shades - Rulon panel grille | 450 lf | 150.00 /lf | 67,500 |
| Mirrors - unframed restroom | 1,145 sf | 35.00 /sf | 40,075 |
| Interior signage | 136,600 sf | 0.35 /sf | 47,810 |
| Toilet partition | 23 ea | 1,020.00 /ea | 23,460 |
| Toilet partition - handicap | 16 ea | 1,650.00 /ea | 26,400 |
| Urinal screens - wall-hung | 15 ea | 433.00 /ea | 6,495 |
| Cubicle curtains | 45 lf | 40.00 /lf | 1,800 |
| Cubicle curtain track | 45 lf | 11.50 /lf | 518 |
| Corner guards | 1 ls | 20,000.00 /ls | 20,000 |
| Toilet paper dispenser | 54 ea | 105.17 /ea | 5,679 |
| Grab bar | 62 ea | 141.38 /ea | 8,765 |
| Soap dispenser - surface mounted | 59 ea | 87.64 /ea | 5,171 |
| Paper towel dispenser - recessed | 32 ea | 136.79 /ea | 4,377 |
| Framed mirrors | 15 ea | 171.00 /ea | 2,565 |
| Sanitary napkin disposal | 46 ea | 274.00 /ea | 12,604 |
| Shower curtains, hooks & rod | 3 ea | 125.00 /ea | 375 |
| Shower seat | 2 ea | 668.00 /ea | 1,336 |
| Mop rack | 3 ea | 230.67 /ea | 692 |
| Fire extinguisher cabinet - fully recessed | 27 ea | 350.00 /ea | 9,450 |
| Student lockers - phenolic | 660 ea | 580.00 /ea | 382,800 |
| Athletic lockers | 80 ea | 350.00 /ea | 28,000 |
| Staff lockers | 12 ea | 400.00 /ea | 4,800 |
| Locker benches | 12 lf | 55.00 /lf | 660 |
| Misc. specialties - Allowance | 136,600 sf | 0.25 /sf | 34,150 |
| **C1030 Specialties/Millwork** | **136,600 sf** | **7.46 /sf** | **1,018,982** |
| **C10 Interior Construction** | **136,600 sf** | **52.97 /sf** | **7,235,868** |

**C20 Stairs**

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **C2010 Stair Construction** | | | |
| ***Place & finish stair treads/landings*** | ***BP#2*** | ***/BP#2*** | |
| Ornamental stairs 3 and 6 - excluding rails | 2 flt | 60,000.00 /flt | 120,000 |
| Egress stair | 5 flt | 30,000.00 /flt | 150,000 |
| ***Ornamental stairs 4 and 5 - excluding rails*** | ***BP#2*** | ***/BP#2*** | |
| Roof ladders | 3 ea | 1,500.00 /ea | 4,500 |
| Guardrails @ Atrium stairs | 235 lf | 500.00 /lf | 117,500 |
| **C2010 Stair Construction** | **136,600 sf** | **2.87 /sf** | **392,000** |
| **C2020 Stair Finishes** | | | |
| Rubber flooring @ ornamental stairs | 770 sf | 8.00 /sf | 6,160 |
| Paint egress stairs | 5 flt | 2,000.00 /flt | 10,000 |
| **C2020 Stair Finishes** | **136,600 sf** | **0.12 /sf** | **16,160** |
| **C20 Stairs** | **136,600 sf** | **2.99 /sf** | **408,160** |
| **C30 Interior Finishes** | | | |
| **C3010 Wall Finishes** | | | |
| Lull, laborer for cleanup by Consigli (Tile) | (1) ls | 7,000.00 /ls | (7,000) |
| Trade support - lull, laborer for cleanup (Tile) | 1 ls | 7,000.00 /ls | 7,000 |
| ***Brick veneer - interior - N/A*** | *-* | */-* | |
| 1/4" steel plate @ tile | 1 ls | 15,000.00 /ls | 15,000 |
| Miscellaneous wood base/trim | 136,600 sf | 0.50 /sf | 68,300 |
| Trim @ Breakout D glass lights | 320 sf | 25.00 /sf | 8,000 |
| Head and sill MDF trim per 1,2/A620 | 1,700 lf | 25.00 /lf | 42,500 |
| P-lam panel | 1,440 sf | 45.00 /sf | 64,800 |
| P-lam panel backsplash | 120 sf | 45.00 /sf | 5,400 |
| Marker tray - bamboo | 2,485 lf | 30.00 /lf | 74,550 |
| MDF bumper rail | 3,715 lf | 25.00 /lf | 92,875 |
| P-lam wall panels - sound reflecting @ Auditorium | 2,925 sf | 45.00 /sf | 131,625 |
| P-lam wall panels - vestibules | 400 sf | 45.00 /sf | 18,000 |
| P-lam projector enclosure @ Auditorium | 1 ea | 2,500.00 /ea | 2,500 |
| Ceramic wall tile | 2,295 sf | 18.00 /sf | 41,310 |
| Quarry tile base | 280 lf | 20.00 /lf | 5,600 |
| Linoleum tile base w/trim | 19,260 lf | 9.00 /lf | 173,340 |
| Linoleum tile base w/trim - VM I10 | (15,545) lf | 9.00 /lf | (139,905) |
| Linoleum tile base - VM I10 | 15,545 lf | 7.00 /lf | 108,815 |
| Rubber base | 2,175 lf | 3.50 /lf | 7,613 |
| Vented base @ Gym | 370 lf | 8.00 /lf | 2,960 |
| Fiberglass reinforced panels (FRP) - wall panels | 2,240 sf | 8.00 /sf | 17,920 |
| Fabric wrapped acoustical panels | 12,275 sf | 20.00 /sf | 245,500 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **C3010 Wall Finishes** | | | |
| Tectum wall panels | 5,535 sf | 18.00 /sf | 99,630 |
| ***Mural panorama wall covering - By Others*** | - | /- | |
| Paint GWB partitions | 227,710 sf | 0.80 /sf | 182,168 |
| ***Paint CMU - N/A*** | - | /- | |
| Epoxy wall paint | 15,550 sf | 2.30 /sf | 35,765 |
| Touchup | 136,600 sf | 0.50 /sf | 68,300 |
| Magnetic writeable wall covering | 9,045 sf | 22.00 /sf | 198,990 |
| **C3010 Wall Finishes** | **136,600 sf** | **11.51 /sf** | **1,571,556** |
| **C3020 Floor Finishes** | | | |
| Lull, laborer for cleanup by Consigli (Resilient) | (1) ls | 48,000.00 /ls | (48,000) |
| Trade support - lull, laborer for cleanup (Resilient) | 1 ls | 48,000.00 /ls | 48,000 |
| ***Polished concrete @ Auditorium - N/A*** | - | /- | |
| ***Wood base - N/A*** | - | /- | |
| Porcelain floor tile | 5,475 sf | 25.00 /sf | 136,875 |
| Quarry floor tile | 1,770 sf | 20.00 /sf | 35,400 |
| Underlayment at 2nd and 3rd floor linoleum - Forbo NR99, exclude corridors | 36,505 sf | 4.00 /sf | 146,020 |
| ***Moisture mitigation - Excluded*** | - | /- | |
| Hardwood stage assembly | 1,610 sf | 25.00 /sf | 40,250 |
| Wood athletic flooring | 8,570 sf | 20.00 /sf | 171,400 |
| Linoleum tile | 90,135 sf | 6.00 /sf | 540,810 |
| Epoxy flooring/base | 5,780 sf | 14.00 /sf | 80,920 |
| Carpet @ Auditorium | 135 sy | 45.00 /sy | 6,075 |
| Seal concrete floor | 7,245 sf | 2.00 /sf | 14,490 |
| Seal concrete floor @ Auditorium | 3,650 sf | 2.00 /sf | 7,300 |
| Entry mats - recessed | 435 sf | 40.00 /sf | 17,400 |
| **C3020 Floor Finishes** | **136,600 sf** | **8.76 /sf** | **1,196,940** |
| **C3030 Ceiling Finishes** | | | |
| Dance floor at auditorium - multi-trade | 1 ls | 75,000.00 /ls | 75,000 |
| Lull, laborer for cleanup by Consigli (Finish Carpentry) | (1) ls | 72,000.00 /ls | (72,000) |
| Lull, laborer for cleanup by Consigli (Ceilings) | (1) ls | 49,000.00 /ls | (49,000) |
| Trade support - lull, laborer for cleanup (Finish Carpentry) | 1 ls | 72,000.00 /ls | 72,000 |
| Trade support - lull, laborer for cleanup (Ceilings) | 1 ls | 49,000.00 /ls | 49,000 |
| P-lam panel on Z-clips @ Breakout | 325 sf | 45.00 /sf | 14,625 |
| Suspended P-lam clouds @ Auditorium | 100 ea | 2,000.00 /ea | 200,000 |
| Gypsum board ceilings | 21,010 sf | 15.25 /sf | 320,411 |
| Gypsum board ceilings - 1 hr | 655 sf | 19.10 /sf | 12,511 |
| Gypsum board ceilings - 2 hr | 80 sf | 22.90 /sf | 1,832 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **C3030 Ceiling Finishes** | | | |
| Gypsum board ceilings - resilient | 5,350 sf | 31.75 /sf | 169,863 |
| Stucco soffit | 1,245 sf | 11.35 /sf | 14,131 |
| Gypsum board soffits | 28,335 sf | 25.45 /sf | 721,126 |
| Gypsum board soffits - VM I11 | (2,250) sf | 25.45 /sf | (57,263) |
| Gypsum board soffits @ Learning Commons | 4,920 sf | 25.45 /sf | 125,214 |
| Gypsum board soffits @ Skylights | 1,915 sf | 25.45 /sf | 48,737 |
| A1 - Armstrong Ultima #1911, random running bond pattern | 21,400 sf | 9.00 /sf | 192,600 |
| A1 - Armstrong Ultima #1911 @ Learning Commons corridors | 9,980 sf | 9.00 /sf | 89,820 |
| A2 - Armstrong Calla #2824 | 20,985 sf | 8.00 /sf | 167,880 |
| A2 - Armstrong Calla #2824 - VM I03 | 1,393 sf | 8.00 /sf | 11,144 |
| A3 - USG Geometrix 3 Dimensional | 3,815 sf | 35.00 /sf | 133,525 |
| A3 - USG Geometrix 3 Dimensional - VM I03 | (1,393) sf | 35.00 /sf | (48,755) |
| A4 - Armstrong Healthzone Ultima | 1,760 sf | 7.00 /sf | 12,320 |
| Paint GWB ceilings | 21,735 sf | 1.00 /sf | 21,735 |
| Paint GWB soffits | 35,170 sf | 1.00 /sf | 35,170 |
| Paint exposed ceilings | 24,085 sf | 1.50 /sf | 36,128 |
| Paint exposed ceilings @ Gym and Auditorium | 14,385 sf | 2.50 /sf | 35,963 |
| **C3030 Ceiling Finishes** | **136,600 sf** | **17.08 /sf** | **2,333,715** |
| **C30 Interior Finishes** | **136,600 sf** | **37.35 /sf** | **5,102,210** |
| **C Interiors** | **136,600 sf** | **93.31 /sf** | **12,746,238** |
| **D Services** | | | |
| **D10 Conveying Systems** | | | |
| **D1010 Elevators & Lifts** | | | |
| Elevator pit ladders | 1 ea | 450.00 /ea | 450 |
| Passenger elevators - cab, equipment | 1 ls | 40,000.00 /ls | 40,000 |
| Passenger elevators - stops | 4 stop | 45,000.00 /stop | 180,000 |
| **D1010 Elevators & Lifts** | **136,600 sf** | **1.61 /sf** | **220,450** |
| **D10 Conveying Systems** | **136,600 sf** | **1.61 /sf** | **220,450** |
| **D20 Plumbing** | | | |
| **D2010 Plumbing** | | | |
| Lull, laborer for cleanup by Consigli (Plumbing) | (1) ls | 83,000.00 /ls | (83,000) |
| Trade support - lull, laborer for cleanup (Plumbing) | 1 ls | 83,000.00 /ls | 83,000 |
| Water closet/wall mnt./carrier/flush valve | 22 ea | 1,330.12 /ea | 29,263 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D2010 Plumbing** | | | |
| Water closet/wall mnt./carrier/flush valve/ADA | 32 ea | 1,367.52 /ea | 43,761 |
| Urinal/wall mnt./carrier/flush valve | 18 ea | 1,202.85 /ea | 21,651 |
| Urinal/wall mnt./carrier/flush valve/ADA | 5 ea | 1,241.35 /ea | 6,207 |
| Lavatory/undermount/std 1-lever faucet | 54 ea | 523.24 /ea | 28,255 |
| Lavatory/undermount/std 1-lever faucet/ADA | 10 ea | 586.41 /ea | 5,864 |
| Lavatory/wall hung/std 1-lever faucet/carrier/ADA | 15 ea | 1,147.55 /ea | 17,213 |
| Sensor faucets/flush | 1 ls | 78,000.00 /ls | 78,000 |
| Mixing valve/single lav. (Leonard #170) | 85 ea | 348.84 /ea | 29,651 |
| P15 Sink/lay-in/1-bowl 20"x22"/std faucet/ADA | 2 ea | 1,560.75 /ea | 3,121 |
| P14 Sink/lay-in/1-bowl 20"x22"/std faucet/ADA Maker Space | 2 ea | 1,610.75 /ea | 3,221 |
| P7 Sink/lay-in/1-bowl 21"x15"/std faucet | 36 ea | 1,584.98 /ea | 57,059 |
| P9 Sink/lay-in/1-bowl 21"x15"/std faucet Art Room | 3 ea | 1,384.98 /ea | 4,155 |
| P9A Sink/lay-in/1-bowl 21"x15"/std faucet/ADA Art Room | 1 ea | 1,455.75 /ea | 1,456 |
| P7A Sink/lay-in/1-bowl 21"x15"/std faucet/ADA | 3 ea | 1,860.75 /ea | 5,582 |
| P8 Sinlk/lay-in/1-bowl/22"x16"/bubbler | 5 ea | 1,715.35 /ea | 8,577 |
| P-13 Sink/acid waste/undermount/std 2-lever faucet/ss - 21"x15"x10"D | 3 ea | 1,508.82 /ea | 4,526 |
| - Solids interceptors (Art Room sinks) | 4 ea | 552.64 /ea | 2,211 |
| Mop sink/floor mnt - 24"x24" | 5 ea | 1,349.01 /ea | 6,745 |
| P6 Shower stall/std valve & access./3'x3' fiberglass | 1 ea | 2,704.96 /ea | 2,705 |
| P6-A Shower stall/std valve & access./5'x3' fiberglass/ADA | 2 ea | 3,701.67 /ea | 7,403 |
| P13 Emergency eye wash station/mixing valve/sink mount | 3 ea | 1,106.71 /ea | 3,320 |
| Emergency shower/eye wash sta./mixing valve/cabinet mount | 7 ea | 3,540.35 /ea | 24,782 |
| Water cooler/bi-level/ADA | 10 ea | 4,418.42 /ea | 44,184 |
| - Plumbing fixtures offload & distribution | 239 ea | 103.07 /ea | 24,634 |
| - Plumbing fixtures rough-in | 239 ea | 128.07 /ea | 30,609 |
| **D2010 Plumbing** | **136,600 sf** | **3.62 /sf** | **494,156** |
| **D2020 Domestic Water Distribution** | | | |
| Insulation/copper pipe/fiberglass | 7,975 lf | 8.44 /lf | 67,307 |
| Water meter w/remote readout - 4" | 1 ea | 2,285.75 /ea | 2,286 |
| Water sub-meter - avg. size | 1 ea | 1,561.84 /ea | 1,562 |
| Water sub-meter - 1.5 Circ | 1 ea | 1,261.84 /ea | 1,262 |
| Water sub-meter - 2" Domestic WH | 1 ea | 1,277.30 /ea | 1,277 |
| Backflow preventer/RPZ-BFP - dishwasher | 1 ea | 1,809.21 /ea | 1,809 |
| Backflow preventer/RPZ-BFP - 2" LW | 2 ea | 1,657.68 /ea | 3,315 |
| Backflow preventer/RPZ-BFP - 4" | 1 ea | 1,960.75 /ea | 1,961 |
| Pressure reducing valve/PRV - 1" | 1 ea | 1,159.21 /ea | 1,159 |
| Pressure reducing valve - 4" | 1 ea | 2,210.75 /ea | 2,211 |
| Recirculation pump/bronze/6.5 gpm - 1/8 hp (B&G Ecocirc) | 1 ea | 1,806.14 /ea | 1,806 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D2020 Domestic Water Distribution** | | | |
| Recirculation pump/bronze/10 gpm - 1/6 hp (B&G #SSF-22) | 2 ea | 709.14 /ea | 1,418 |
| Expansion tank/ASME/potable - 9 gal (B&G #PTA-30V) | 1 ea | 1,250.61 /ea | 1,251 |
| TMV/master/hi-lo temp. | 1 ea | 2,759.21 /ea | 2,759 |
| Hose bibbs w/vac. breaker/encased - interior | 19 ea | 382.50 /ea | 7,268 |
| Hose bibbs/exterior/encased (Zurn #Z1320) | 3 ea | 452.07 /ea | 1,356 |
| Trap primers/electronic - 8 outlet (PPP #PT-8) | 8 ea | 1,359.91 /ea | 10,879 |
| Shock absorbers/12 - 33 fixture units (Shoktrol #200) | 3 ea | 269.77 /ea | 809 |
| Valve box/washing machine | 1 ea | 226.54 /ea | 227 |
| Valve box/ice machine | 3 ea | 176.54 /ea | 530 |
| Domestic water entrance UG/ductile iron - 4" | 20 lf | 306.14 /lf | 6,123 |
| Domestic water AG/type "L" copper/press fit ftgs. - avg. size | 525 lf | 23.31 /lf | 12,235 |
| Domestic water AG/type "L" copper/press fit - 1/2" TP | 1,120 lf | 13.02 /lf | 14,577 |
| Domestic water AG/type "L" copper/press fit - 1/2" NP | 800 lf | 13.02 /lf | 10,412 |
| Domestic water AG/type "L" copper/press fit - 1/2" | 1,460 lf | 13.02 /lf | 19,002 |
| Domestic water AG/type "L" copper/press fit - 3/4" NP | 450 lf | 15.76 /lf | 7,091 |
| Domestic water AG/type "L" copper/press fit - 3/4" | 1,240 lf | 15.76 /lf | 19,539 |
| Domestic water AG/type "L" copper/press fit - 1" NP | 100 lf | 20.56 /lf | 2,056 |
| Domestic water AG/type "L" copper/press fit - 1" | 50 lf | 20.57 /lf | 1,028 |
| Domestic water AG/type "L" copper/press fit - 1-1/4" NP | 100 lf | 25.23 /lf | 2,523 |
| Domestic water AG/type "L" copper/press fit - 1-1/4" | 115 lf | 25.23 /lf | 2,902 |
| Domestic water AG/type "L" copper/press fit - 1-1/2" | 400 lf | 30.31 /lf | 12,125 |
| Domestic water AG/type "L" copper/press fit - 2" NP | 450 lf | 41.16 /lf | 18,523 |
| Domestic water AG/type "L" copper/press fit - 2" | 300 lf | 41.16 /lf | 12,349 |
| Domestic water AG/type "L" copper/press fit - 2-1/2" | 285 lf | 66.38 /lf | 18,919 |
| Domestic water AG/type "L" copper/press fit - 3" | 480 lf | 84.91 /lf | 40,759 |
| Domestic water AG/type "L" copper/press fit - 4" | 100 lf | 116.00 /lf | 11,600 |
| Non-potable water AG/type "L" copper/solder - Hood Tie In | 60 lf | 22.94 /lf | 1,377 |
| - Domestic water piping accessories DOM | 6,095 lf | 2.78 /lf | 16,917 |
| - Domestic water piping accessories NP | 1,900 lf | 2.78 /lf | 5,274 |
| - Domestic water heat tracing/small bore piping All LHW | 1,900 lf | 25.97 /lf | 49,340 |
| - Domestic water pipe & equipment I.D. DOM | 6,095 lf | 1.61 /lf | 9,817 |
| - Domestic water pipe & equipment I.D. NP | 1,900 lf | 1.52 /lf | 2,881 |
| - Domestic water pressure gauges & thermometers | 12 ea | 120.61 /ea | 1,447 |
| - Domestic water support steel/additional to hangers & clamps | 1 ls | 1,074.56 /ls | 1,075 |
| - Layout Mech Room | 1 ls | 20,000.00 /ls | 20,000 |
| - Domestic water storage tank | 1 ls | 3.52 /ls | 4 |
| Domestic Boilers/gas fired/399 mbh (AO Smith #BTH-300A) | 2 ea | 15,618.42 /ea | 31,237 |
| Boiler Flues | 1 ls | 45,525.00 /ls | 45,525 |
| Water Heater Flues | 1 ls | 24,000.00 /ls | 24,000 |
| HWH/indirect fed - 300 gal | 1 ea | 7,418.42 /ea | 7,418 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D2020 Domestic Water Distribution** | **136,600 sf** | **3.96 /sf** | **540,525** |
| **D2030 Sanitary Waste** | | | |
| Floor drain - 3" (#ZN415-6B) | 16 ea | 294.07 /ea | 4,705 |
| Floor drain - 4" (#ZN415-8B) | 4 ea | 353.07 /ea | 1,412 |
| Floor sink/12x12 - 4" (#Z1900) | 8 ea | 2,581.14 /ea | 20,649 |
| Floor cleanouts - 4" (#ZN1400) | 37 ea | 291.07 /ea | 10,770 |
| Wall cleanouts - 4" (#Z1468) | 10 ea | 101.08 /ea | 1,011 |
| Grease interceptor/interior/size 800/75 gpm/150 gal. | 2 ea | 4,291.56 /ea | 8,583 |
| 8000 Gallon Concrete Grease Trap | 1 ea | 17,649.12 /ea | 17,649 |
| Elevator sump pump/oil minder | 1 ea | 3,812.28 /ea | 3,812 |
| Grease interceptor flow control | 1 ea | 417.14 /ea | 417 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 2" | 220 lf | 31.98 /lf | 7,036 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 3" | 236 lf | 36.45 /lf | 8,602 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 4" | 610 lf | 44.78 /lf | 27,315 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 6" | 275 lf | 74.82 /lf | 20,576 |
| Sanitary AG/cast iron no hub pipe & ftgs. - avg. size Fixture Runouts | 1,560 lf | 47.33 /lf | 73,828 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 1-1/2" | 30 lf | 33.82 /lf | 1,015 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 2" | 750 lf | 34.83 /lf | 26,119 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 3" | 980 lf | 44.36 /lf | 43,468 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 4" | 495 lf | 52.52 /lf | 25,999 |
| Grease waste UG/cast iron single hub pipe & ftgs. - 2" | 40 lf | 31.98 /lf | 1,279 |
| Grease waste UG/cast iron single hub pipe & ftgs. - 3" | 20 lf | 36.45 /lf | 729 |
| Grease waste UG/cast iron single hub pipe & ftgs. - 4" | 220 lf | 44.78 /lf | 9,851 |
| Grease waste AG/cast iron no hub pipe & ftgs. - 2" | 55 lf | 34.83 /lf | 1,915 |
| Grease waste AG/cast iron no hub pipe & ftgs. - 3" | 65 lf | 44.36 /lf | 2,883 |
| Grease waste AG/cast iron no hub pipe & ftgs. - 4" | 70 lf | 52.52 /lf | 3,677 |
| - Sanitary waste & vent piping accessories | 5,626 lf | 1.77 /lf | 9,976 |
| - Sanitary piping & equipment I.D. | 5,626 lf | 1.81 /lf | 10,171 |
| **D2030 Sanitary Waste** | **136,600 sf** | **2.51 /sf** | **343,448** |
| **D2040 Rain Water Drainage** | | | |
| Insulation/rainleader pipe/fiberglass/PVC jacketed/horiz. & vert. | 1,200 lf | 40.61 /lf | 48,737 |
| Roof drain/#ZC100 - 4" | 9 ea | 298.07 /ea | 2,683 |
| Roof drain/#ZC100 - 5" | 2 ea | 387.84 /ea | 776 |
| Roof drain/#ZC100 - 6" | 14 ea | 387.84 /ea | 5,430 |
| Floor cleanouts - 4" (#ZN1400) | 6 ea | 291.07 /ea | 1,746 |
| Wall cleanouts - 4" (#Z1468) | 12 ea | 101.07 /ea | 1,213 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 4" | 90 lf | 44.77 /lf | 4,030 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 6" | 90 lf | 74.82 /lf | 6,734 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 8" | 70 lf | 103.25 /lf | 7,228 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D2040 Rain Water Drainage** | | | |
| Rainleader UG/cast iron single hub pipe & ftgs. - 10" | 160 lf | 141.04 /lf | 22,566 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 12" | 25 lf | 186.99 /lf | 4,675 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 4" | 265 lf | 52.53 /lf | 13,919 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 6" | 410 lf | 81.16 /lf | 33,274 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 8" | 460 lf | 133.84 /lf | 61,565 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 10" | 10 lf | 198.47 /lf | 1,985 |
| - Rainleader piping accessories | 1,580 lf | 1.77 /lf | 2,802 |
| - Rainleader piping & equipment I.D. | 1,580 lf | 1.46 /lf | 2,314 |
| **D2040 Rain Water Drainage** | **136,600 sf** | **1.62 /sf** | **221,676** |
| **D2090 Other Plumbing Systems** | | | |
| General requirements (management, permits, as-builts, coring, fire stopping) | 136,600 sf | 0.75 /sf | 102,450 |
| 3D/BIM coordination | 1 ls | 12,000.00 /ls | 12,000 |
| Core drilling | 1 ls | 10,000.00 /ls | 10,000 |
| Project management | 1 ls | 50,000.00 /ls | 50,000 |
| Kitchen Equipment Tie ins | 1 ls | 12,000.00 /ls | 12,000 |
| Commissioning support/day | 5 day | 824.56 /day | 4,123 |
| Gas Flow Meter - avg. size | 1 ea | 1,857.68 /ea | 1,858 |
| Emergency gas shut off/cabinet w/1" solonoid & UL ball valve 1114, 1111A | 2 ea | 3,968.42 /ea | 7,937 |
| Emergency gas shut off/cabinet w/1-1/2" solonoid & UL ball valve KIT | 1 ea | 5,093.42 /ea | 5,093 |
| - Remote panic buttons | 2 ea | 828.07 /ea | 1,656 |
| Gas turret/single | 5 ea | 212.07 /ea | 1,060 |
| Gas turret/double | 5 ea | 320.54 /ea | 1,603 |
| Gas piping/sch 40 black steel CW t&c - 1" | 240 lf | 28.68 /lf | 6,882 |
| Gas piping/sch 40 black steel CW t&c - 1-1/4" | 120 lf | 34.14 /lf | 4,097 |
| Gas piping/sch 40 black steel CW t&c - 1-1/2" | 65 lf | 37.25 /lf | 2,421 |
| Gas piping/sch 40 black steel CW t&c - 2" | 10 lf | 42.28 /lf | 423 |
| Gas piping/sch 40 blk stl ERW weld - 2-1/2" | 30 lf | 45.73 /lf | 1,372 |
| Gas piping/sch 40 blk stl ERW weld - 3" | 75 lf | 54.12 /lf | 4,059 |
| Gas piping/sch 40 blk stl ERW weld - 4" | 60 lf | 87.71 /lf | 5,263 |
| Gas piping for generator | 250 lf | 80.00 /lf | 20,000 |
| Gas piping/sch 40 blk stl ERW weld - 8" | 25 lf | 180.43 /lf | 4,511 |
| - Gas piping accessories | 625 lf | 2.52 /lf | 1,577 |
| - Gas piping link seals | 1 ea | 404.61 /ea | 405 |
| - Gas piping & equipment I.D. | 625 lf | 28.95 /lf | 18,094 |
| Acid neut. Tank/5 gallon - 1-sink (Orion style 5) | 1 ea | 622.14 /ea | 622 |
| Acid neut. tank/15 gallon - 3-sinks (Orion style 5) | 3 ea | 911.21 /ea | 2,734 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D2090 Other Plumbing Systems** | | | |
| Acid neut. tank/55 gallon - | 2 ea | 1,912.28 /ea | 3,825 |
| - Limestone chips/50 lb. bag | 24 ea | 43.77 /ea | 1,050 |
| PH Monitoring (2) locations | 2 ea | 6,612.28 /ea | 13,225 |
| Floor drain - 6" (#ZN415-AA-8B) | 3 ea | 480.84 /ea | 1,443 |
| Floor cleanout/heavy duty - 4" (#ZN1400-K-AR) | 5 ea | 424.84 /ea | 2,124 |
| Wall cleanouts/#Z1468 - 4" | 5 ea | 101.07 /ea | 505 |
| Acid waste UG/sch 40 polypropylene fuseal & ftgs. - 3" | 20 lf | 58.29 /lf | 1,166 |
| Acid waste UG/sch 40 polypropylene fuseal & ftgs. - 4" | 230 lf | 68.91 /lf | 15,849 |
| Tie-ins to Lab Hoods acid waste & vent - A/G | 3 ea | 815.35 /ea | 2,446 |
| Acid waste AG/sch 40 polypropylene fuseal & ftgs. - 2" | 800 lf | 51.44 /lf | 41,154 |
| Acid waste AG/sch 40 polypropylene fuseal & ftgs. - 3" | 400 lf | 65.67 /lf | 26,269 |
| Acid waste AG/sch 40 polypropylene fuseal & ftgs. - 4" | 360 lf | 77.44 /lf | 27,877 |
| - Acid waste & vent piping accessories | 1,810 lf | 2.02 /lf | 3,662 |
| - Acid waste piping & equipment I.D. | 1,810 lf | 2.56 /lf | 4,636 |
| Wiring PH Monitor and Misc Control | 1 ls | 6,000.00 /ls | 6,000 |
| SM - Flue piping/double wall/stainless steel/6" pipe - linear foot DWH | 600 lf | 97.98 /lf | 58,786 |
| SM - Flue piping/double wall/stainless steel/6" fittings - each DWH | 16 ea | 122.47 /ea | 1,960 |
| SM - Flue piping/double wall/stainless steel/6" fittings - each DWH | 8 lf | 122.47 /lf | 980 |
| **D2090 Other Plumbing Systems** | **136,600 sf** | **3.63 /sf** | **495,194** |
| **D20 Plumbing** | **136,600 sf** | **15.34 /sf** | **2,094,999** |
| **D30 Heating, Ventilating, and Air Conditioning (HVAC)** | | | |
| **D3010 Energy Supply** | | | |
| Insulation/pipe/copper | 14,483 lf | 7.09 /lf | 102,715 |
| Insulation/pipe/weld | 3,838 lf | 12.50 /lf | 47,975 |
| Hot water s&r/type "L" copper solder - 3/4" | 8,970 lf | 20.16 /lf | 180,835 |
| Hot water s&r/type "L" copper solder - 1" | 1,760 lf | 25.01 /lf | 44,018 |
| Hot water s&r/type "L" copper solder - 1-1/4" | 1,260 lf | 28.57 /lf | 35,998 |
| Hot water s&r/type "L" copper solder - 1-1/2" | 890 lf | 32.82 /lf | 29,210 |
| Hot water s&r/type "L" copper solder - 2" | 1,550 lf | 41.25 /lf | 63,937 |
| Hot water s&r/sch 40 blk stl ERW weld - 2-1/2" | 605 lf | 50.55 /lf | 30,583 |
| Hot water s&r/sch 40 blk stl ERW weld - 3" | 475 lf | 59.42 /lf | 28,225 |
| Hot water s&r/sch 40 blk stl ERW weld - 4" | 756 lf | 82.30 /lf | 62,219 |
| Hot water s&r/sch 40 blk stl ERW weld - 6" | 520 lf | 134.07 /lf | 69,716 |
| Hot water s&r/sch 40 blk stl ERW weld - 8" | 220 lf | 167.74 /lf | 36,903 |
| Glycol water s&r/type "L" copper solder - 2" | 53 lf | 41.25 /lf | 2,186 |
| Glycol water s&r/sch 40 blk stl ERW weld - 2-1/2" | 47 lf | 50.55 /lf | 2,376 |
| Glycol water s&r/sch 40 blk stl ERW weld - 3" | 90 lf | 59.42 /lf | 5,348 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D3010 Energy Supply** | | | |
| Glycol water s&r/sch 40 blk stl ERW weld - 4" | 152 lf | 82.30 /lf | 12,510 |
| Glycol water s&r/sch 40 blk stl ERW weld - 6" | 910 lf | 134.07 /lf | 122,004 |
| Glycol water s&r/sch 40 blk stl ERW weld - 8" | 110 lf | 167.74 /lf | 18,451 |
| - Hydronic piping accessories | 18,368 lf | 2.53 /lf | 46,506 |
| Pump/base mount/790 gpm (HW) | 2 ea | 8,167.68 /ea | 16,335 |
| Chilled water pump house (pumps & accesories, enclosure, piping, unit heater | 1 ls | 226,667.68 /ls | 226,668 |
| - Suction diffusers | 2 ea | 1,460.58 /ea | 2,921 |
| - Flex connector/HVAC pumps | 4 ea | 556.35 /ea | 2,225 |
| - Triple duty valves | 2 ea | 2,312.69 /ea | 4,625 |
| Air separators | 1 ea | 4,333.84 /ea | 4,334 |
| Expansion tanks/ASME | 2 ea | 7,167.68 /ea | 14,335 |
| Chemical treatment (lump sum) | 1 ls | 20,000.00 /ls | 20,000 |
| Glycol feed/50 gal. tank w/pump (Neptune #G-50-1) | 2 ea | 5,272.92 /ea | 10,546 |
| - Glycol solution/40% propylene | 1,000 gal | 25.21 /gal | 25,212 |
| **D3010 Energy Supply** | **136,600 sf** | **9.29 /sf** | **1,268,916** |
| **D3020 HVAC** | | | |
| Boiler/HW/gas/high eff. cond. - 4,000 mbh Riello AR 4000 | 2 ea | 57,501.52 /ea | 115,003 |
| Boiler circulator pump | 2 ea | 1,708.46 /ea | 3,417 |
| Boiler combustion air/galvanized steel 10" | 200 lf | 38.00 /lf | 7,600 |
| Flue piping/double wall/stainless steel 10" | 205 lf | 185.00 /lf | 37,925 |
| **D3020 HVAC** | **136,600 sf** | **1.20 /sf** | **163,945** |
| **D3030 Cooling Generating Systems** | | | |
| Chiller/air cooled - 370 tons | 1 ea | 381,153.80 /ea | 381,154 |
| Buffer tanks/Lochinvar - 300 gals. | 1 ea | 8,750.76 /ea | 8,751 |
| **D3030 Cooling Generating Systems** | **136,600 sf** | **2.85 /sf** | **389,905** |
| **D3040 HVAC Distribution** | | | |
| Lull, laborer for cleanup by Consigli (HVAC) | (1) ls | 343,000.00 /ls | (343,000) |
| Trade support - lull, laborer for cleanup (HVAC) | 1 ls | 343,000.00 /ls | 343,000 |
| Insulation/ductwork/blanket wrap | 83,500 sf | 3.55 /sf | 296,088 |
| Insulation/ductwork/weatherproof exposed | 4,500 sf | 12.89 /sf | 57,986 |
| Sheetmetal & accessories/galvanized | 111,320 lb | 11.04 /lb | 1,228,973 |
| Sheetmetal & accessories/galvanized (perforated) | 869 lb | 14.49 /lb | 12,592 |
| Sheetmetal & accessories/galvanized (smoke exhasut) | 9,735 lb | 11.04 /lb | 107,474 |
| Sheetmetal & accessories/galvanized (perforated liner) | 4,000 lb | 14.49 /lb | 57,960 |
| Sheetmetal & accessories/stainless steel (dishwasher) | 350 lb | 22.28 /lb | 7,798 |
| Sheetmetal & accessories/welded stainless steel (kitchen exhaust) | 1,060 lb | 29.78 /lb | 31,567 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D3040 HVAC Distribution** | | | |
| Sheetmetal & accessories/welded stainless steel (kiln exhaust) | 500 lb | 29.78 /lb | 14,890 |
| Sheetmetal & accessories/welded stainless steel (3 - fume hoods) | 2,700 lb | 29.78 /lb | 80,406 |
| Sheetmetal & accessories/fabric/1-row cable (DuctSox) - 20" | 405 lf | 76.50 /lf | 30,982 |
| Sheetmetal & accessories/fabric/1-row cable (DuctSox) - 24" | 305 lf | 81.29 /lf | 24,792 |
| Duct enclosure (roof) | 1 ea | 5,424.10 /ea | 5,424 |
| SM - Diffusers, registers & grilles | 136,600 sf | 0.20 /sf | 27,320 |
| SM - Linear slot diffusers (supply) | 6 ea | 465.39 /ea | 2,792 |
| ***SM - Linear slot diffusers (exhaust) - architectural*** | ***lf*** | ***/lf*** | |
| SM - Displ. Diffuser/Floor Mnt. | 156 ea | 1,289.88 /ea | 201,221 |
| SM - Combination fire/smoke dampers/louver type/UL | 20 ea | 776.53 /ea | 15,530 |
| SM - Motorized damper | 14 ea | 1,107.92 /ea | 15,511 |
| SM - Smoke detectors/duct mount | 40 ea | 747.47 /ea | 29,899 |
| SM - Sound attenuators/in-line/std. gauge | 239,000 cfm | 0.55 /cfm | 131,341 |
| SM - Kitchen exhaust hood/st. steel/install only (by KES) | 1 ea | 2,339.28 /ea | 2,339 |
| SM - Dishwasher exhaust hood/st. steel/install only (by KES) | 1 ea | 1,559.52 /ea | 1,560 |
| SEF-1-4 | 4 ea | 17,339.28 /ea | 69,357 |
| EF-3&4 /centrifugal downblast/roof/direct drive - 500 cfm | 2 ea | 1,069.31 /ea | 2,139 |
| EF-1&2 /centrifugal downblast/roof/direct drive - 2,500 cfm | 2 ea | 1,771.24 /ea | 3,542 |
| KEF-1&2/centrifugal upblast/roof | 2 ea | 2,734.82 /ea | 5,470 |
| FEF-1,2,3,4,5 Lab exhaust fan/roof - 1,200 cfm | 5 ea | 9,084.82 /ea | 45,424 |
| **D3040 HVAC Distribution** | **136,600 sf** | **18.38 /sf** | **2,510,378** |
| **D3050 Terminal & Package Units** | | | |
| Variable air volume box - small | 12 ea | 533.15 /ea | 6,398 |
| Variable air volume box - medium | 143 ea | 668.62 /ea | 95,612 |
| RTU-1-4 Classrooms (service enclosure, HW&CHW coils, energy recovery) | 80,000 cfm | 15.75 /cfm | 1,260,000 |
| RTU-5 Gymnasium (service enclosure, HW&CHW coils, energy recovery) | 15,000 cfm | 16.25 /cfm | 243,750 |
| RTU-6 Auditorium (service enclosure, HW&CHW coils, energy recovery) | 12,000 cfm | 16.25 /cfm | 195,000 |
| RTU-7 Lockers (service enclosure, HW&CHW coils, energy recovery) | 2,000 cfm | 18.25 /cfm | 36,500 |
| MAU-1 Make-up air unit/HW&CHW coil/ | 5,000 cfm | 7.25 /cfm | 36,250 |
| Mini-split AC system/1-zone/wall mnt./cool only - 12 mbh | 1 ea | 2,072.92 /ea | 2,073 |
| Mini-split AC system/1-zone/wall mnt./cool only - 18 mbh | 5 ea | 2,681.66 /ea | 13,408 |
| Mini-split AC system/1-zone/wall mnt./cool only - 24 mbh | 2 ea | 2,956.03 /ea | 5,912 |
| Mini-split refrigeration line set/6-12 mbh - 50' | 2 ea | 584.88 /ea | 1,170 |
| Mini-split refrigeration line set/15-18 mbh - 50' | 10 ea | 599.88 /ea | 5,999 |
| Mini-split refrigeration line set/24-30 mbh - 50' | 4 ea | 614.88 /ea | 2,460 |
| Mini-split condensate drains/type"L" copper | 450 lf | 19.43 /lf | 8,744 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D3050 Terminal & Package Units** | | | |
| A/C cond. pump | 8 ea | 253.74 /ea | 2,030 |
| INS - Mini-split Insulation/copper pipe | 450 lf | 6.87 /lf | 3,090 |
| ATC - Mini-split condensing units (w/factory controls) | 8 ea | 879.76 /ea | 7,038 |
| ATC - Mini-split indoor units (w/factory controls) | 8 ea | 587.35 /ea | 4,699 |
| Radiant ceiling panels/24" wide - ft. | 1,450 lf | 120.00 /lf | 174,000 |
| FTR-2 Finned-tube radiation w/enclosure - 1 row | 260 lf | 194.24 /lf | 50,502 |
| FTR-1 Finned-tube radiation w/enclosure - 2 row | 570 lf | 259.37 /lf | 147,841 |
| FTR-3 Finned-tube radiation w/enclosure - 2 row | 40 lf | 297.49 /lf | 11,900 |
| Fin-tube radiation/electric - 2 kW | 8 ea | 739.88 /ea | 5,919 |
| Cabinet unit heater/hot water/wall mount/recessed - avg. size | 4 ea | 1,573.62 /ea | 6,294 |
| Cabinet unit heater/hot water/ceiling mount - avg. size | 10 ea | 1,749.51 /ea | 17,495 |
| Unit heater/hot water/horiz./propeller - avg. size | 2 ea | 1,092.41 /ea | 2,185 |
| Misc. VFD's | 1 ls | 35,000.00 /ls | 35,000 |
| VFD w/keypad/disconnect/bypass/NEMA 1 - HW pumps | 2 ea | 6,028.47 /ea | 12,057 |
| ***VFD w/keypad/disconnect/bypass/NEMA 1 - CHW pumps w/ pump house*** | ***ea*** | ***/ea*** | |
| **D3050 Terminal & Package Units** | **136,600 sf** | **17.52 /sf** | **2,393,325** |
| **D3060 HVAC Instrumentation & Controls** | | | |
| Automatic temperature controls/cost per sq. ft. | 136,600 sf | 0.25 /sf | 34,150 |
| ATC - Air valve/hood exhaust/HEX | 3 ea | 4,194.32 /ea | 12,583 |
| ATC - Air valves/no coil control wiring - 3 pts./fume hood | 9 pnt | 437.00 /pnt | 3,933 |
| ATC - RTU's/custom - 30 pts. | 240 pnt | 1,303.18 /pnt | 312,763 |
| ATC - MUA units - 10 pts. | 10 pnt | 759.44 /pnt | 7,594 |
| ATC - Exhaust fans - 3 pts. | 18 pnt | 711.10 /pnt | 12,800 |
| ATC - Life safty fans - 8 pts. | 32 pnt | 766.15 /pnt | 24,517 |
| ATC - Lab exhaust fans - 5 pts./fan | 25 pnt | 766.15 /pnt | 19,154 |
| ATC - Boilers/modular - 10 pts. | 20 pnt | 821.19 /pnt | 16,424 |
| ATC - Pumps - 4 pts. | 16 pnt | 766.15 /pnt | 12,258 |
| ATC - VFD wiring for pumps (remote mount) - 4 pts. | 16 pnt | 763.91 /pnt | 12,223 |
| ATC - Circulators - 2 pts. | 4 pnt | 488.68 /pnt | 1,955 |
| ATC - Chillers - 15 pts. | 15 pnt | 1,303.18 /pnt | 19,548 |
| ATC - VAV box/no coil (ATC furn./factory install controls) 2 pts. | 310 pnt | 408.36 /pnt | 126,592 |
| ATC - Fintube radiation zones - 2 pts. | 20 pnt | 381.96 /pnt | 7,639 |
| ATC - electric fintube radiation zones - 2 pts. | 4 pnt | 381.95 /pnt | 1,528 |
| ATC - Cabinet unit heaters - 3 pts. | 42 pnt | 381.96 /pnt | 16,042 |
| ATC - Unit heaters - 3 pts. | 6 pnt | 381.95 /pnt | 2,292 |
| ATC - Radiant ceiling panel zones - 2 pts. | 246 pnt | 381.96 /pnt | 93,961 |
| ATC - Plumbing points - 10 pts. | 10 pnt | 595.50 /pnt | 5,955 |
| ATC - Elctrical points - 10 pts. | 10 pnt | 595.50 /pnt | 5,955 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D3060 HVAC Instrumentation & Controls** | **136,600 sf** | **5.49 /sf** | **749,864** |
| **D3070 Testing, Adjusting & Balancing** | | | |
| Testing & balancing/cost per sq. ft. | 136,600 sf | 0.65 /sf | 88,790 |
| **D3070 Testing, Adjusting & Balancing** | **136,600 sf** | **0.65 /sf** | **88,790** |
| **D3090 Other HVAC Systems & Equipment** | | | |
| General requirements (sq. ft.) | 136,600 sf | 1.15 /sf | 157,090 |
| 3D/BIM coordination | 1 ls | 100,000.00 /ls | 100,000 |
| Commissioning support/lump sum | 1 ls | 15,000.00 /ls | 15,000 |
| Dust collection system | 1 ea | 17,339.28 /ea | 17,339 |
| Kiln exhaust | 1 ls | 5,500.00 /ls | 5,500 |
| Equipment hoisting/rigging/setting/start-up | 136,600 sf | 1.50 /sf | 204,900 |
| **D3090 Other HVAC Systems & Equipment** | **136,600 sf** | **3.66 /sf** | **499,829** |
| **D30 Heating, Ventilating, and Air Conditioning (HVAC)** | **136,600 sf** | **59.04 /sf** | **8,064,951** |
| **D40 Fire Protection Systems** | | | |
| **D4010 Sprinklers** | | | |
| Lull, laborer for cleanup by Consigli (Fire Protection) | (1) ls | 31,000.00 /ls | (31,000) |
| Trade support - lull, laborer for cleanup (Fire Protection) | 1 ls | 31,000.00 /ls | 31,000 |
| General requirements (management/design, permits, as-builts, coring, fire stopping) | 136,600 sf | 0.50 /sf | 68,300 |
| Fire dept. inlet connection - 2-1/2" polished brass - 3 -way | 1 ea | 1,863.93 /ea | 1,864 |
| Sprinkler head - wet - recessed pendant | 903 ea | 125.42 /ea | 113,250 |
| Sprinkler head - wet - pendant or upright | 522 ea | 77.23 /ea | 40,313 |
| Sprinkler head - wet - sidewall | 151 ea | 87.51 /ea | 13,213 |
| Sprinkler head - wet - window | 34 ea | 87.51 /ea | 2,975 |
| Sprinkler head - extended coverage pendant or upright | 120 ea | 127.23 /ea | 15,267 |
| Sprinkler head - dry - sidewall (wet system) | 22 ea | 293.06 /ea | 6,447 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 1" | 3,465 lf | 23.99 /lf | 83,116 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 1-1/4" | 600 lf | 27.93 /lf | 16,757 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 1-1/2" | 5,200 lf | 30.66 /lf | 159,417 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 2" | 650 lf | 34.57 /lf | 22,468 |
| Sprinkler main piping black steel sch. 40 w/ fittings (avg. size) | 1,000 lf | 62.18 /lf | 62,184 |
| Sprinkler main piping black steel sch. 10 w/ fittings 3" | 450 lf | 36.32 /lf | 16,345 |
| Sprinkler main piping black steel sch. 10 w/ fittings 4" | 3,180 lf | 39.66 /lf | 126,127 |
| Sprinkler main piping black steel sch. 10 w/ fittings 6" | 500 lf | 69.39 /lf | 34,695 |
| Wet alarm valve - 6" | 1 ea | 3,656.71 /ea | 3,657 |
| Double check valve (BFP) assembly - 6" | 1 ea | 8,244.56 /ea | 8,245 |
| Butterfly valve - 6" | 2 ea | 1,566.71 /ea | 3,133 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D4010 Sprinklers** | | | |
| Zone flow control valve - 4" | 7 ea | 2,521.71 /ea | 17,652 |
| Waterflow switch | 8 ea | 421.96 /ea | 3,376 |
| Tamper switch | 8 ea | 356.96 /ea | 2,856 |
| Water motor gong bell | 1 ea | 628.36 /ea | 628 |
| **D4010 Sprinklers** | **136,600 sf** | **6.02 /sf** | **822,286** |
| **D4020 Standpipes** | | | |
| Standpipe - sch 40 black steel piping w/ fittings - 6" | 125 lf | 99.13 /lf | 12,391 |
| Drain riser - sch 40 black steel piping w/ fittings - 3" | 125 lf | 49.66 /lf | 6,208 |
| Fire hose valve - 2-1/2" | 12 ea | 353.36 /ea | 4,240 |
| **D4020 Standpipes** | **136,600 sf** | **0.17 /sf** | **22,839** |
| **D4030 Fire Protection Specialties** | | | |
| Fire valve cabinet - steel - recessed | 12 ea | 894.50 /ea | 10,734 |
| **D4030 Fire Protection Specialties** | **136,600 sf** | **0.08 /sf** | **10,734** |
| **D4090 Other Fire Protection Systems** | | | |
| Hydraulic calculation & shop drawings | 1 ls | 8,000.00 /ls | 8,000 |
| 3D/BIM coordination | 1 ls | 10,000.00 /ls | 10,000 |
| **D4090 Other Fire Protection Systems** | **136,600 sf** | **0.13 /sf** | **18,000** |
| **D40 Fire Protection Systems** | **136,600 sf** | **6.40 /sf** | **873,859** |
| **D50 Electrical Systems** | | | |
| **D5010 Gear & Distribution** | | | |
| Feeder (MC) - 20A (kitchen equipment - x42) | 3,150 lf | 5.75 /lf | 18,111 |
| Feeder (MC) - 30A (kitchen equipment - x2) | 200 lf | 5.87 /lf | 1,173 |
| 1" PVC - 30A (3#8 & #10G) | 250 lf | 10.29 /lf | 2,573 |
| Feeder (MC) - 40A (kitchen equipment - x1) | 100 lf | 7.01 /lf | 701 |
| Feeder (MC) - 60A (kitchen equipment - x2) | 200 lf | 10.55 /lf | 2,110 |
| Power for automatic temperature control panels (BMS) | 12 ea | 460.91 /ea | 5,531 |
| Electric heat trace power (cables, sensors, controllers by Div. 21 / 22) | 1,900 lf | 3.50 /lf | 6,650 |
| Service switch: 20A/3P, NEMA-1 | 1 ea | 107.43 /ea | 107 |
| Fused Disco: 20A/3P, NEMA-1 | 7 ea | 323.22 /ea | 2,263 |
| Fused Disco: 100A/3P, NEMA-1 | 2 ea | 1,185.41 /ea | 2,371 |
| Fused Disco: 200A/3P, NEMA-1 | 3 ea | 1,555.38 /ea | 4,666 |
| Fused Disco: 1000A/3P, NEMA-1 | 2 ea | 7,290.94 /ea | 14,582 |
| Wire gymnasum equipment SMC control stations (furnished by others) | 8 ea | 1,058.23 /ea | 8,466 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5010 Gear & Distribution** | | | |
| Wire motors and controllers | 15 ea | 821.28 /ea | 12,319 |
| Kitchen equipment final connections (includes flexible whip) | 47 ea | 72.36 /ea | 3,401 |
| Mount & wire VFD's (furnished by Div. 23) | 8 ea | 646.55 /ea | 5,172 |
| MAU (5000cfm) - circuit / disconnect (3R) / connection | 1 ea | 2,503.41 /ea | 2,503 |
| RTU's - circuit / disconnect (3R) / connection (small) | 3 ea | 4,736.19 /ea | 14,209 |
| RTU's - circuit / disconnect (3R) / connection (large) | 4 ea | 7,010.29 /ea | 28,041 |
| Mini-split systems (indoor/outdoor) - circuits / disconnects (3R) / connections | 8 ea | 3,225.23 /ea | 25,802 |
| Chiller (370T) - circuit / disconnect (3R) / connection | 1 ea | 25,825.56 /ea | 25,826 |
| Smoke exhaust fans - circuit / disconnect / connection (100A) | 4 ea | 2,400.01 /ea | 9,600 |
| Kitchen exhaust fans - circuit / disconnect / connection | 2 ea | 1,420.91 /ea | 2,842 |
| Kiln exhaust system - circuit / disconnect / connection | 1 ea | 2,655.30 /ea | 2,655 |
| Dust collection system - circuit / disconnect / connection | 1 ea | 3,579.00 /ea | 3,579 |
| Fume hood exhaust fans - circuit / disconnect / connection | 5 ea | 1,214.10 /ea | 6,071 |
| Exhaust fans - circuit / disconnect / connection | 4 ea | 1,214.11 /ea | 4,856 |
| Power to electronic trap primers - 120V | 8 ea | 100.19 /ea | 801 |
| Hot water pumps - circuit / disconnect / connection | 2 ea | 1,673.87 /ea | 3,348 |
| Boilers - circuit / disconnect / connection | 2 ea | 1,204.71 /ea | 2,409 |
| Chilled water pump house pumps & heaters - circuits / disconnects / connections | 1 ls | 6,158.00 /ls | 6,158 |
| Hot water heater - circuit / service switch / connection | 1 ea | 591.53 /ea | 592 |
| Cabinet unit heaters - circuit / service switch / connection | 14 ea | 868.28 /ea | 12,156 |
| Unit heaters - circuit / service switch / connection | 2 ea | 868.28 /ea | 1,737 |
| Elevator sump pump - circuit / disconnect (3R) / connection | 1 ea | 1,247.28 /ea | 1,247 |
| Domestic boilers - circuit / disconnect (3R) / connection | 2 ea | 1,247.28 /ea | 2,495 |
| Recirculation pumps - circuit / disconnect / connection | 3 ea | 997.87 /ea | 2,994 |
| Glycol feed pumps - circuit / disconnect / connection | 2 ea | 997.87 /ea | 1,996 |
| Boiler circulation pumps - circuit / disconnect / connection | 2 ea | 997.87 /ea | 1,996 |
| Fin-tube radiators (2kW) - circuit / disconnect / connection | 8 ea | 1,847.40 /ea | 14,779 |
| VAV's - circuit / disconnect / connection | 155 ea | 298.83 /ea | 46,318 |
| Acid neutralization tanks / PH monitoring - circuit / connection | 2 ea | 965.80 /ea | 1,932 |
| Circuit breaker - 20A/1P (panel) | 1 ea | 149.86 /ea | 150 |
| Switchboard: 3000A bus, 2500A rated MCB (100%), 480/277V, 3PH, 65kAIC | 1 ea | 45,417.04 /ea | 45,417 |
| Panelboard: 100A, 42-circuit | 14 ea | 2,550.41 /ea | 35,706 |
| Panelboard: 225A, 42-circuit | 9 ea | 3,420.66 /ea | 30,786 |
| Panelboard: 225A, 84-circuit | 9 ea | 4,338.66 /ea | 39,048 |
| Panelboard: 400A, 42-circuit | 3 ea | 5,435.74 /ea | 16,307 |
| Panelboard: 400A, 84-circuit | 1 ea | 10,724.46 /ea | 10,724 |
| Distribution panel: 600A | 2 ea | 9,886.92 /ea | 19,774 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5010 Gear & Distribution** | | | |
| Distribution panel: 800A | 3 ea | 12,443.25 /ea | 37,330 |
| Transformer: floor/wall - 75kVA, 480V:208V | 1 ea | 4,384.00 /ea | 4,384 |
| K-13 Transformer: floor - 225kVA, 480V:208V | 3 ea | 12,168.50 /ea | 36,506 |
| Engineered Services - Training (Manufacturer) | 1 ea | 4,165.70 /ea | 4,166 |
| Engineered Services - Start-Up Assistance (Manufacturer) | 1 ea | 3,519.08 /ea | 3,519 |
| Feeder (EMT/CU) - 20A [BMS to utility meter] | 200 lf | 7.43 /lf | 1,486 |
| Feeder (EMT/CU) - 20A [EP1A to Elevator Controller] | 125 lf | 7.43 /lf | 929 |
| Feeder (EMT/CU) - 60A [MSB to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [2DP1A to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [2DP1B to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [2DP1C to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [4DP1B to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 90A [2DP1A to KPP1A] | 42 lf | 15.96 /lf | 670 |
| Feeder (EMT/CU) - 100A [MSB to LP1A] | 40 lf | 20.74 /lf | 830 |
| Feeder (EMT/CU) - 100A [4DP1B to LP1B] | 50 lf | 20.74 /lf | 1,037 |
| Feeder (EMT/CU) - 100A [4DP1C to LP1C] | 27 lf | 20.74 /lf | 560 |
| Feeder (EMT/CU) - 100A [4DP1B to LP2B] | 50 lf | 20.74 /lf | 1,037 |
| Feeder (EMT/CU) - 100A [2DP1A to LP2C] | 190 lf | 20.74 /lf | 3,940 |
| Feeder (EMT/CU) - 100A [4DP1B to LP3B] | 150 lf | 20.74 /lf | 3,111 |
| Feeder (EMT/CU) - 100A [4DP1C to LP3C] | 165 lf | 20.74 /lf | 3,422 |
| Feeder (EMT/CU) - 100A [MSB to LP1D] | 150 lf | 20.74 /lf | 3,111 |
| Feeder (EMT/CU) - 100A [EHP1A to Elevator Controller] | 125 lf | 20.74 /lf | 2,592 |
| Feeder (EMT/CU) - 100A [TEP1A to TEP2B] | 200 lf | 20.74 /lf | 4,148 |
| Feeder (EMT/CU) - 100A [TEP1A to TEP2C] | 200 lf | 20.74 /lf | 4,148 |
| Feeder (EMT/CU) - 100A [TEP1A to TEP1D] | 200 lf | 20.74 /lf | 4,148 |
| Feeder (EMT/CU) - 100A [TEP1A to UPS] | 50 lf | 20.74 /lf | 1,037 |
| Feeder (EMT/CU) - 100A [2DP1A to MP1A] | 410 lf | 20.74 /lf | 8,503 |
| Feeder (EMT/CU) - 125A [UPS to EP1A] | 150 lf | 20.99 /lf | 3,149 |
| Feeder (EMT/CU) - 150A [2DP1B to MP1B] | 50 lf | 26.82 /lf | 1,341 |
| Feeder (EMT/CU) - 150A [2DP1C to MSB] | 200 lf | 26.82 /lf | 5,365 |
| Feeder (EMT/CU) - 150A [2DP1C to MP3C] | 250 lf | 26.82 /lf | 6,706 |
| Feeder (EMT/CU) - 150A [2DP1B to PP2B] | 60 lf | 26.82 /lf | 1,609 |
| Feeder (EMT/CU) - 150A [2DP1C to PP2C] | 100 lf | 26.82 /lf | 2,682 |
| Feeder (EMT/CU) - 150A [2DP1B to PP1B] | 50 lf | 26.82 /lf | 1,341 |
| Feeder (EMT/CU) - 150A [2DP1C to MP1C] | 40 lf | 26.83 /lf | 1,073 |
| Feeder (EMT/CU) - 150A [2DP1C to PP2C] | 125 lf | 26.82 /lf | 3,353 |
| Feeder (EMT/CU) - 150A [2DP1C to PP3C] | 150 lf | 26.82 /lf | 4,024 |
| Feeder (EMT/CU) - 150A [4DP1C to PP3B] | 165 lf | 26.82 /lf | 4,426 |
| Feeder (EMT/CU) - 150A [2DP1C to PP1C] | 50 lf | 26.82 /lf | 1,341 |
| Feeder (EMT/CU) - 150A [2DP1A to PP1D] | 100 lf | 26.82 /lf | 2,682 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5010 Gear & Distribution** | | | |
| Feeder (EMT/CU) - 200A [MSB to ATS-LS] | 100 lf | 32.13 /lf | 3,213 |
| Feeder (EMT/CU) - 200A [ATS-LS to ELP1A] | 40 lf | 32.13 /lf | 1,285 |
| Feeder (EMT/CU) - 200A [2DP1A to PP1A] | 50 lf | 32.13 /lf | 1,607 |
| Feeder (EMT/CU) - 200A [Cam Lock Box to ATS-LS] | 60 lf | 32.13 /lf | 1,928 |
| Feeder (EMT/CU) - 225A [MSB to Dimming Rack HDP] | 250 lf | 46.72 /lf | 11,679 |
| Feeder (EMT/CU) - 225A [2DP1A to Dimming Rack SDP] | 200 lf | 46.72 /lf | 9,344 |
| Feeder (EMT/CU) - 225A [EHP1A to EHP3C] | 250 lf | 46.72 /lf | 11,679 |
| Feeder (EMT/CU) - 225A [MP3C to PP3C] | 45 lf | 46.72 /lf | 2,102 |
| Feeder (EMT/CU) - 225A [2DP1B to MP3B] | 100 lf | 46.72 /lf | 4,672 |
| Feeder (EMT/CU) - 225A [4DP1C to MHP3C] | 165 lf | 49.70 /lf | 8,200 |
| Feeder (EMT/CU) - 225A [ATS-OS to EHP1A] | 200 lf | 49.70 /lf | 9,940 |
| Feeder (EMT/CU) - 225A [MSB to ATS-OS] | 75 lf | 49.70 /lf | 3,727 |
| Feeder (EMT/CU) - 400A [MSB to MHP1A] | 50 lf | 73.75 /lf | 3,688 |
| Feeder (EMT/CU) - 400A [EHP1C to EHP1A] | 100 lf | 73.75 /lf | 7,375 |
| Feeder (EMT/CU) - 400A [Generator to ATS-LR] (interior) | 430 lf | 73.75 /lf | 31,713 |
| Feeder (EMT/CU) - 400A [MSB to ATS-LR] | 375 lf | 78.46 /lf | 29,422 |
| Feeder (EMT/CU) - 400A [MHP-LR to ATS-LR] | 10 lf | 78.46 /lf | 785 |
| Feeder (EMT/CU) - 400A [ATS-LR to MHP-LR] | 50 lf | 73.75 /lf | 3,688 |
| Feeder (EMT/CU) - 600A [MSB to 4DP1B] | 200 lf | 108.91 /lf | 21,782 |
| Feeder (EMT/CU) - 600A [MSB to 2DP1A] | 70 lf | 108.91 /lf | 7,624 |
| Feeder (EMT/CU) - 800A [MSB to 2DP1C] | 125 lf | 138.78 /lf | 17,348 |
| Feeder (EMT/CU) - 800A [MSB to 4DP1C] | 200 lf | 138.78 /lf | 27,757 |
| Empty conduit (EMT) - 3/4" [utility meter to switchboard] | 75 lf | 6.28 /lf | 471 |
| Feeder (MC) - 125A [75kVA] | 30 lf | 12.82 /lf | 385 |
| Feeder (MC) - 225A [75kVA] | 30 lf | 35.43 /lf | 1,063 |
| Feeder (MC) - 400A [225kVA] | 90 lf | 59.32 /lf | 5,339 |
| Feeder (MC) - 800A [225kVA] | 90 lf | 111.65 /lf | 10,048 |
| M.I. Cable - 4-1/c #6 [ELP1B to ELP3B] | 150 lf | 36.15 /lf | 5,422 |
| M.I. Cable - 4-1/c #3 [EHP1A to EP3C] | 165 lf | 65.42 /lf | 10,794 |
| M.I. Cable - 4-1/c #3 [ELP1A to EDP] | 125 lf | 65.42 /lf | 8,178 |
| M.I. Cable - 4-1/c #3 [ELP1A to EP1C] | 125 lf | 65.42 /lf | 8,178 |
| M.I. Cable - 4-1/c #2 [EPL1A to ELP1B] | 150 lf | 72.60 /lf | 10,890 |
| M.I. Cable - 4-1/c #2 [ELP1A to ELP1D] | 417 lf | 77.24 /lf | 32,208 |
| Quick term kit - #6 4-1/c | 2 ea | 359.96 /ea | 720 |
| Quick term kit - #3 4-1/c | 6 ea | 710.21 /ea | 4,261 |
| Quick term kit - #2 4-1/c | 4 ea | 734.64 /ea | 2,939 |
| Brass plate (per hole) | 12 ea | 92.10 /ea | 1,105 |
| Empty conduit - sch 40 PVC: 1 x 2" [future Canopy PV] | 280 lf | 26.88 /lf | 7,526 |
| Empty conduit - sch 40 PVC: 2 x 2" [future PV] | 1,250 lf | 35.04 /lf | 43,800 |
| Empty conduit - sch 40 PVC: 2 x 4" [future Canopy PV] | 160 lf | 45.14 /lf | 7,222 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5010 Gear & Distribution** | | | |
| ATS-OS: 225A, 277/480V, 4P, no iso by-pass - open transition | 1 ea | 6,752.90 /ea | 6,753 |
| ATS-LS: 150A, 277/480V, 4P, w/ iso by-pass - open transition | 1 ea | 11,058.30 /ea | 11,058 |
| ATS-LR: 400A, 277/480V, 4P, w/ iso by-pass - open transition | 1 ea | 19,961.43 /ea | 19,961 |
| Power junction w/feed (EMT) - 20A | 1 ea | 337.91 /ea | 338 |
| Empty conduit (EMT) - 3/4" | 2,000 lf | 5.11 /lf | 10,218 |
| **D5010 Gear & Distribution** | **136,600 sf** | **8.18 /sf** | **1,117,861** |
| **D5020 Lighting & Branch Wiring** | | | |
| Lull, laborer for cleanup by Consigli (Electrical) | (1) ls | 230,000.00 /ls | (230,000) |
| Trade support - lull, laborer for cleanup (Electrical) | 1 ls | 230,000.00 /ls | 230,000 |
| Science Classrooms - CO system solenoid shutdown- 120V power & control wiring | 2 ea | 5,326.40 /ea | 10,653 |
| Kitchen - Ansul system - 120V power & control wiring | 1 ea | 10,237.00 /ea | 10,237 |
| Gym scoreboards and shot clocks - wiring only, F&I by Div. 11 | 2 ea | 5,344.80 /ea | 10,690 |
| On-site programming & startup (manufacturer) | 1 ls | 3,913.41 /ls | 3,913 |
| Single pole switch (120/277V) | 13 ea | 65.04 /ea | 845 |
| Key op switch (120/277V) | 2 ea | 72.44 /ea | 145 |
| Three position momentary contact switch | 1 ea | 226.42 /ea | 226 |
| Ceiling PIR occupancy sensor (24VDC) | 323 ea | 247.23 /ea | 79,854 |
| Occupancy sensor power packs (120V) | 200 ea | 82.04 /ea | 16,408 |
| Wall dimmer switch (0-10V) | 227 ea | 131.04 /ea | 29,746 |
| Photocells (daylight harvesting) | 84 ea | 265.06 /ea | 22,265 |
| Universal dimming room controller, 1-channel | 50 ea | 536.88 /ea | 26,844 |
| ALCS master switching / dimming station | 1 ea | 821.83 /ea | 822 |
| Plug load controllers (20A/120V) | 50 ea | 300.80 /ea | 15,040 |
| Emergency lighting transfer (bypass relay) - non-dimming | 30 ea | 236.81 /ea | 7,104 |
| Astronomical time clock | 1 ea | 919.97 /ea | 920 |
| Rough in for Theater Lighting - Allowance | 1 allw | 9,400.01 /allw | 9,400 |
| Power for Theater Lighting - Allowance | 1 allw | 28,199.87 /allw | 28,200 |
| Sub lighting control panels | 3 ea | 2,394.56 /ea | 7,184 |
| Master lighting control panel | 1 ea | 4,383.41 /ea | 4,383 |
| Energy control unit | 1 ea | 2,157.58 /ea | 2,158 |
| System server unit | 1 ea | 1,316.75 /ea | 1,317 |
| Network Ethernet switch | 1 ea | 2,270.85 /ea | 2,271 |
| MC Cable (12/2) - 20A | 12,500 lf | 3.45 /lf | 43,126 |
| MC Cable (12/3) - 20A | 3,500 lf | 3.87 /lf | 13,541 |
| EMT (12/2) - 20A | 2,000 lf | 6.70 /lf | 13,404 |
| EMT (12/2) - 20A | 50 lf | 7.13 /lf | 356 |
| RJ45 Cable, 25LF (plenum-rated) | 407 ea | 72.10 /ea | 29,344 |
| RJ45 Cable, 50LF (plenum rated) | 228 ea | 111.05 /ea | 25,318 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5020 Lighting & Branch Wiring** | | | |
| MC Cable (12/2) - 20A | 11,370 lf | 3.45 /lf | 39,227 |
| MC Cable (10/2) - 20A [homeruns - x372] | 24,180 lf | 4.36 /lf | 105,516 |
| EMT (12/2) - 20A | 2,000 lf | 6.70 /lf | 13,404 |
| PVC (10/2) - 20A | 450 lf | 6.68 /lf | 3,007 |
| Duplex receptacle - 20A - tamper resistant | 497 ea | 78.60 /ea | 39,065 |
| Duplex receptacle - 20A - switched with IO module | 14 ea | 67.78 /ea | 949 |
| Simplex receptacle - 20A [scoreboard control] | 2 ea | 70.18 /ea | 140 |
| Duplex receptacle - 20A - GFCI | 187 ea | 92.44 /ea | 17,286 |
| Duplex receptacle - 20A - GFCI - W.P. | 29 ea | 129.27 /ea | 3,749 |
| Duplex receptacle - 20A [kitchen equipment] - circuitry in Equipment Wiring] | 33 ea | 67.79 /ea | 2,237 |
| Duplex receptacle - 20A [A/V] | 9 ea | 67.79 /ea | 610 |
| Duplex receptacle - 20A [CR] | 8 ea | 67.80 /ea | 542 |
| Exterior pedestal receptacle, GFI type, Wayne Tyler, Inc. #CB-BOX | 5 ea | 1,292.26 /ea | 6,461 |
| Quadruplex receptacle - 20A | 325 ea | 93.78 /ea | 30,479 |
| Quadruplex receptacle - 20A - switched with IO module | 18 ea | 93.79 /ea | 1,688 |
| Duplex receptacle - 20A - USB | 14 ea | 99.44 /ea | 1,392 |
| Specialty receptacle - 20A - L5-20R | 11 ea | 101.01 /ea | 1,111 |
| Specialty receptacle - 20A - L14-20R | 1 ea | 104.81 /ea | 105 |
| Specialty receptacle - 30A - L5-30R | 23 ea | 111.69 /ea | 2,569 |
| Quadruplex receptacle - 20A - GFCI | 5 ea | 143.12 /ea | 716 |
| Hardwired A/C junction (MC) - 20A [A/V] | 2 ea | 318.93 /ea | 638 |
| Hardwired A/C junction (MC) - 20A [fume hoods] | 4 ea | 318.93 /ea | 1,276 |
| Power junction w/feed (MC) - 20A [water coolers/bottle fillers] | 11 ea | 221.21 /ea | 2,433 |
| Power junction w/feed (MC) - 20A | 28 ea | 221.21 /ea | 6,194 |
| Trash compactor feed & connection | 2 ea | 2,243.92 /ea | 4,488 |
| Overhead door power & connection | 3 ea | 1,223.50 /ea | 3,671 |
| Dock leveler feed & connection | 1 ea | 3,532.90 /ea | 3,533 |
| Emergency power offs (EPO) | 10 ea | 295.11 /ea | 2,951 |
| Wiremold receptacles - G4 | 110 ea | 31.05 /ea | 3,416 |
| G4000 dual-channel wiremold - 24" spacing | 220 lf | 63.39 /lf | 13,945 |
| Reduce lighting by $1.50/sf - VM E01 | (136,600) sf | 1.50 /sf | (204,900) |
| LK24: 2'x2' lay-in fixture [O] | 24 ea | 198.57 /ea | 4,766 |
| SPFL: LED flood light [C] | 20 ea | 682.90 /ea | 13,658 |
| SPNF: LED flood light, narrow [C] | 20 ea | 682.90 /ea | 13,658 |
| LR2 (emerg): 2' linear 2" aperature recessed luminaire [O] | 183 ea | 300.48 /ea | 54,987 |
| LR2: 2' linear 2" aperature recessed luminaire [O] | 912 ea | 300.48 /ea | 274,033 |
| G4: 4' linear rugged low profile 360 deg adjustable flood luminaire [O] | 80 ea | 1,160.93 /ea | 92,874 |
| LS4: 4' utility fixtre with frosted acrylic diffuser [O] | 20 ea | 246.16 /ea | 4,923 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5020 Lighting & Branch Wiring** | | | |
| LS4 (emerg): 4' utility fixture with frosted acrylic diffuser [O] | 14 ea | 246.16 /ea | 3,446 |
| LS8: 8' utility fixtre with frosted acrylic diffuser [O] | 11 ea | 411.94 /ea | 4,531 |
| LS4A (emerg): 4' utility fixtre with frosted acrylic diffuser [O] | 12 ea | 494.94 /ea | 5,939 |
| LS4A: 4' utility fixture with frosted acrylic diffuser [O] | 12 ea | 494.94 /ea | 5,939 |
| LP8 (emerg): Axis 8' LED fixture [O] | 9 ea | 1,027.94 /ea | 9,251 |
| LS8 (emerg): 8' utility fixture with frosted acrylic diffuser [O] | 10 ea | 411.94 /ea | 4,119 |
| JB: utility fixture with frosted tempered glass globe & guard [O] | 4 ea | 245.95 /ea | 984 |
| PC3: 6" down light fixture with dead-front gasketed trim [O] | 1 ea | 298.16 /ea | 298 |
| LRW (emerg): 6" aperature LED linear recessed fixture / qty. of 18 [C] | 114 lf | 146.99 /lf | 16,757 |
| PC1: 4" down light fixture, 0-10V dimming capable [O] | 24 ea | 298.16 /ea | 7,156 |
| RC1: 6" down light fixture [O] | 45 ea | 271.54 /ea | 12,219 |
| RC1 (emerg): 6" down light fixture [O] | 18 ea | 271.54 /ea | 4,888 |
| LS2 (emerg): 2' utility fixture [O] | 2 ea | 177.98 /ea | 356 |
| LSV4: 4' linear utility fixture with prismatic polcarbonate lens [C] | 4 ea | 675.93 /ea | 2,704 |
| RC2: 4" down light fixture, 0-10V dimming [O] | 8 ea | 230.56 /ea | 1,844 |
| LR4: 4' linear 2" aperature recessed luminaire with frosted lens [O] | 1 ea | 410.45 /ea | 410 |
| LUL: LED tape light with AL channel [C] | 1,840 lf | 88.49 /lf | 162,829 |
| LC3: linear cove Xeleum lighting / qty. of 96 [O] | 1,925 lf | 121.99 /lf | 234,826 |
| LWW: LED tape light with AL channel [C] | 1,408 lf | 88.49 /lf | 124,599 |
| RSH: 6" down light fixture with dead-front gasketed trim [O] | 1 ea | 306.54 /ea | 307 |
| LC2: linear cove fixture with frosted diffuser / qty. of 10 [O] | 76 lf | 148.23 /lf | 11,265 |
| PC2: 6" down light fixture with dead-front gasketed trim [O] | 28 ea | 298.16 /ea | 8,348 |
| LCL: LED tape light with AL channel [C] | 3,051 lf | 88.49 /lf | 269,994 |
| LSL: LED strip mounted on edge of stage / qty. of 1 | 59 lf | 305.95 /lf | 18,051 |
| Exit sign, ceiling mounted, double sided [O] | 34 ea | 196.16 /ea | 6,669 |
| Exit sign, ceiling mounted, single sided [O] | 16 ea | 183.16 /ea | 2,931 |
| Exit sign, wall mounted | 18 ea | 313.16 /ea | 5,637 |
| Exit sign, ceiling mounted, single sided - handicap [O] | 2 ea | 433.16 /ea | 866 |
| LRC (emerg): 6" aperature LED linear recessed fixture / qty. of 46 [C] | 596 lf | 161.70 /lf | 96,373 |
| Revised lighting package from Omni-Lite | (1) ls | 271,965.00 /ls | (271,965) |
| MC Cable (12/2) - 20A (concealed branch) | 12,068 lf | 3.67 /lf | 44,291 |
| MC Cable (10/2) - 20A (concealed homeruns) | 2,400 lf | 4.64 /lf | 11,142 |
| EMT (12/2) - 20A (exposed branch) | 4,023 lf | 7.13 /lf | 28,679 |
| EMT (10/2) - 20A (exposed homeruns) | 500 lf | 8.58 /lf | 4,290 |
| SL4: LED egress / perimeter lighting fixture - custom color/finish [O] | 20 ea | 565.36 /ea | 11,307 |
| MC Cable (12/2) - 20A | 1,200 lf | 3.67 /lf | 4,404 |
| **D5020 Lighting & Branch Wiring** | **136,600 sf** | **13.46 /sf** | **1,838,194** |
| **D5030 Communications & Security** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5030 Communications & Security** | | | |
| Externally mounted SPD's | 6 ea | 3,131.70 /ea | 18,790 |
| Tel/data J-hook system (plenum) | 136,600 sf | 0.19 /sf | 25,681 |
| Cable tray - 18"W (IDF/MDF only) | 200 lf | 75.55 /lf | 15,109 |
| Empty conduit (EMT) - 2" | 650 lf | 11.19 /lf | 7,271 |
| Copper ground bar w/isolators - 2"x1/4" | 4 ea | 280.03 /ea | 1,120 |
| Conduit sleeve w/ fireproofing - 4" | 20 ea | 201.11 /ea | 4,022 |
| Data outlet - (1) CAT-6A cable | 20 ea | 264.84 /ea | 5,297 |
| Data outlet - (1) CAT-6A cable [audio-visual] | 12 ea | 264.84 /ea | 3,178 |
| Data outlet - (2) CAT-6A cables | 131 ea | 466.16 /ea | 61,067 |
| Tel/data outlet - (3) CAT-6A cables | 91 ea | 652.82 /ea | 59,407 |
| Floor box tel/data outlet - (3) CAT-6A cables | 2 ea | 652.83 /ea | 1,306 |
| Voice outlet - (1) CAT-6A cable (WAP's by Owner) | 79 ea | 263.70 /ea | 20,832 |
| Wireless access point - (1) CAT-6A cable (WAP's by Owner) | 138 ea | 263.70 /ea | 36,390 |
| TVE - Video outlet | 56 ea | 838.75 /ea | 46,970 |
| TVC - Video outlet | 2 ea | 838.77 /ea | 1,678 |
| Double gang junction box with (4) 1" C | 54 ea | 482.68 /ea | 26,065 |
| FO - 12 strand SM | 1,750 lf | 5.27 /lf | 9,225 |
| FO - 12 strand MM | 1,500 lf | 7.10 /lf | 10,642 |
| 4-Post Full Height Rack | 10 ea | 1,170.17 /ea | 11,702 |
| Vertical cable wire manager | 20 ea | 314.09 /ea | 6,282 |
| Horizontal cable wire manager | 10 ea | 80.25 /ea | 803 |
| Copper patch panel - 96 port | 15 ea | 1,244.28 /ea | 18,664 |
| Fiber optic patch panel - 24 port | 6 ea | 570.06 /ea | 3,420 |
| Fiber enclosure (rack mtd.) | 6 ea | 485.85 /ea | 2,915 |
| Network switch - 24 port | 2 ea | 5,390.24 /ea | 10,780 |
| S1: wall mounted loudspeaker - 1 gang metal box w/ cover | 2 ea | 228.33 /ea | 457 |
| S2: ceiling loud speaker - custom backbox | 6 ea | 308.23 /ea | 1,849 |
| S3: ceiling loud speaker - 4" SQ metal box w/ cover | 16 ea | 179.94 /ea | 2,879 |
| S4: ceiling loud speaker - 4" SQ metal box w/ cover | 2 ea | 251.94 /ea | 504 |
| S5: ceiling loud speaker - 4" SQ metal box w/ cover (New) | 2 ea | 245.27 /ea | 491 |
| D1: display back box, Chief PAC-526 | 3 ea | 371.35 /ea | 1,114 |
| F1: floor box, FSR FL-500P-6 floor box w/ finished cover | 1 ea | 469.58 /ea | 470 |
| V1: wall mounted video projector - 1 gang metal box w/ cover | 1 ea | 179.47 /ea | 179 |
| R1: receptacle panel - 2 gang metal box w/ cover | 3 ea | 242.43 /ea | 727 |
| R2: receptacle panel - 12"x12"x4" NEMA-1 enclosure w/ oversized flush | 2 ea | 242.43 /ea | 485 |
| R3: receptacle panel - 3 gang metal box w/ cover | 4 ea | 311.69 /ea | 1,247 |
| R5: receptacle panel - 3 gang metal box w/ cover | 1 ea | 242.43 /ea | 242 |
| R6: receptacle panel - 12"x12"x4" NEMA-1 enclosure w/ oversized flush | 2 ea | 405.94 /ea | 812 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5030 Communications & Security** | | | |
| BP: wall mounted button panel - 1 gang metal box w/ cover | 3 ea | 221.77 /ea | 665 |
| J1: junction box - type 1 - 12"x12"x4" NEMA-1 enclosure w/ oversized flush | 2 ea | 723.57 /ea | 1,447 |
| J2: junction box - type 2 - 18"x18"x4" NEMA-1 enclosure w/ oversized flush | 1 ea | 844.78 /ea | 845 |
| J3: junction box - type 3 - same as Type 2 | 3 ea | 844.78 /ea | 2,534 |
| A1: Wall mounted antenna - 1 gang deep metal box w/ cover | 2 ea | 159.74 /ea | 319 |
| A2: Wall mounted antenna - 1 gang deep metal box w/ cover | 1 ea | 159.74 /ea | 160 |
| A3: Ceiling mounted antenna - 4" SQ metal box w/ cover | 2 ea | 138.32 /ea | 277 |
| A4: Ceiling mounted antenna - 4" SQ metal box w/ cover | 1 ea | 138.31 /ea | 138 |
| PS: Production communication speaker station - 4 gang deep metal box w/ cov | 5 ea | 385.28 /ea | 1,926 |
| PC: Production communication - 1 gang deep metal box w/ cover | 1 ea | 134.38 /ea | 134 |
| T1: Wall mounted touch panel - 3 gang metal box w/ cover | 2 ea | 249.04 /ea | 498 |
| VC: Wall mounted audio volume control - 1 gang deep metal box | 2 ea | 134.39 /ea | 269 |
| MC: Motor controller - 4" SQ metal box w/ cover | 3 ea | 86.46 /ea | 259 |
| C1: Wall mounted camera - 2 gang deep metal box w/ cover | 1 ea | 193.57 /ea | 194 |
| A/V Equipment Rack | 2 ea | 1,001.85 /ea | 2,004 |
| M1: Ceiling mounted microphone - 1 gang deep metal box w/ cover | 1 ea | 134.38 /ea | 134 |
| Intercom sub-stations | 6 ea | 1,009.28 /ea | 6,056 |
| Intercom master-stations | 5 ea | 3,327.13 /ea | 16,636 |
| Speaker - ceiling mouted | 269 ea | 405.93 /ea | 109,194 |
| Speaker - wall mounted | 32 ea | 611.85 /ea | 19,579 |
| Volume control | 24 ea | 177.96 /ea | 4,271 |
| Power supply (80) units - speakers 24V DC | 4 ea | 2,661.71 /ea | 10,647 |
| PA console | 1 ea | 14,251.90 /ea | 14,252 |
| PA equipment power connection - 120V | 1 ea | 256.53 /ea | 257 |
| AM/FM/CD/DVD tuner | 1 ea | 694.40 /ea | 694 |
| Speaker system testing | 1 ea | 1,986.71 /ea | 1,987 |
| Two way communication call box (recessed) | 20 ea | 799.75 /ea | 15,995 |
| Power supply w/battery back up | 1 ea | 1,714.28 /ea | 1,714 |
| Two way communication base station (28 zone) | 1 ea | 5,980.66 /ea | 5,981 |
| Tel/data outlet - (1) CAT-6A cable | 20 ea | 264.84 /ea | 5,297 |
| Tel/data outlet - (2) CAT-6A cables | 1 ea | 466.16 /ea | 466 |
| System testing | 1 ea | 1,016.70 /ea | 1,017 |
| Clock, wall mounted - 12" round | 126 ea | 283.06 /ea | 35,665 |
| Master clock w/ roof mounted antenna | 1 ea | 3,778.57 /ea | 3,779 |
| Wireless clock repeater | 1 ea | 647.06 /ea | 647 |
| Wireless clock transciever | 1 ea | 647.06 /ea | 647 |
| Program unit | 1 ea | 991.96 /ea | 992 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5030 Communications & Security** | | | |
| Speaker baffle, clock back box | 74 ea | 202.78 /ea | 15,006 |
| Wire guard | 20 ea | 57.70 /ea | 1,154 |
| Clock wiring (EMT) | 700 lf | 7.03 /lf | 4,923 |
| Clock wiring (RS-485 plenum) | 500 lf | 3.08 /lf | 1,540 |
| System testing | 1 ls | 33.83 /ls | 34 |
| Card readers | 22 ea | 1,163.83 /ea | 25,604 |
| Card readers - W.P. | 3 ea | 1,967.78 /ea | 5,903 |
| Electro-magnetic lock | 6 ea | 657.91 /ea | 3,947 |
| Request to exit motion sensor | 26 ea | 322.33 /ea | 8,380 |
| Electric strike | 40 ea | 400.49 /ea | 16,020 |
| Thermal disconnecting means | 20 ea | 427.58 /ea | 8,552 |
| 24V power supply | 20 ea | 295.11 /ea | 5,902 |
| Junction box - 6"x6"x4" | 20 ea | 130.61 /ea | 2,612 |
| Power transfer hinge | 20 ea | 377.68 /ea | 7,554 |
| Intrusion digital keypads | 4 ea | 984.97 /ea | 3,940 |
| Dual tech motion detectors | 77 ea | 595.80 /ea | 45,876 |
| Door contacts | 63 ea | 465.74 /ea | 29,342 |
| Access control panel | 1 ea | 8,222.56 /ea | 8,223 |
| Tie in to lighting control system | 1 ea | 402.23 /ea | 402 |
| Security wiring - cable | 7,500 lf | 3.80 /lf | 28,527 |
| Security wiring (EMT) | 2,250 lf | 8.53 /lf | 19,181 |
| Power junctions - 120V/20A | 2 ea | 193.20 /ea | 386 |
| Connect to CCTV system | 1 ea | 665.43 /ea | 665 |
| Proximity cards | 250 ea | 2.35 /ea | 588 |
| Software / licenses, programming, testing, startup (manufacturer) | 1 ea | 13,308.52 /ea | 13,309 |
| CCTV color monitors | 2 ea | 815.52 /ea | 1,631 |
| 360-degree multi-sensor interior cameras | 28 ea | 1,659.85 /ea | 46,476 |
| Dome I.P. camera - exterior | 19 ea | 1,996.28 /ea | 37,929 |
| Dome I.P. camera - interior - fixed | 27 ea | 1,471.85 /ea | 39,740 |
| Camera monitoring station | 1 ea | 1,330.85 /ea | 1,331 |
| Video recorders | 2 ea | 3,131.71 /ea | 6,263 |
| Video switchers | 2 ea | 1,627.71 /ea | 3,255 |
| Camera wiring (EMT) | 2,500 lf | 8.76 /lf | 21,899 |
| Camera wiring - cable | 7,400 lf | 4.04 /lf | 29,885 |
| Power junction - 120V/20A | 2 ea | 193.20 /ea | 386 |
| Software / licenses, programming, testing, startup (manufacturer) | 1 ea | 13,308.52 /ea | 13,309 |
| ***Temporary fire alarm heat detection coverage / stairwell pull stations / temp notification - N/A*** | - | /- | |
| Fire alarm impairment plan (NFPA-101) | 1 ls | 10,000.00 /ls | 10,000 |
| Elevator fire alarm interfacing | 1 ls | 5,000.00 /ls | 5,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5030 Communications & Security** | | | |
| Manual pull stations | 25 ea | 202.12 /ea | 5,053 |
| Mass notification | 1 ls | 49,999.98 /ls | 50,000 |
| Smoke detectors | 82 ea | 220.39 /ea | 18,072 |
| Smoke detector w/ elevator recall | 3 ea | 373.26 /ea | 1,120 |
| Smoke detectors (for Atrium) | 89 ea | 220.39 /ea | 19,615 |
| Smoke detectors w/ elevator recall (for Atrium) | 3 ea | 373.25 /ea | 1,120 |
| Carbon monoxide detector (w/ monitor module) | 5 ea | 367.16 /ea | 1,836 |
| Beam detector (receiver & transmitter) | 5 ea | 416.88 /ea | 2,084 |
| Duct smoke detector (furnish & wire) | 40 ea | 838.91 /ea | 33,556 |
| Remote test switch w/ indicating light | 40 ea | 194.88 /ea | 7,795 |
| Control modules | 20 ea | 265.75 /ea | 5,315 |
| Addressable monitor modules | 30 ea | 160.83 /ea | 4,825 |
| Tamper switch connection (via monitor module) | 8 ea | 560.06 /ea | 4,480 |
| Flow switch connection (via monitor module) | 8 ea | 403.67 /ea | 3,229 |
| Door hold device (magnetic) | 5 ea | 388.88 /ea | 1,944 |
| Wire motorized dampers (120V) | 14 ea | 407.48 /ea | 5,705 |
| Wire combination fire/smoke damper (120V & SLC) | 20 ea | 608.50 /ea | 12,170 |
| Strobe only | 48 ea | 175.36 /ea | 8,417 |
| Speaker/strobes | 150 ea | 246.56 /ea | 36,983 |
| Speaker/strobe - W.P. | 1 ea | 309.72 /ea | 310 |
| Horn/visual - wall mounted | 52 ea | 222.79 /ea | 11,585 |
| Exterior beacons (weatherproof) | 4 ea | 388.83 /ea | 1,555 |
| Fire alarm transponder panels | 6 ea | 928.51 /ea | 5,571 |
| Fire alarm annunciators w/ microphones | 3 ea | 2,107.39 /ea | 6,322 |
| FACP w/ 60-minute battery backup (Notifier NFS640) | 1 ea | 6,999.66 /ea | 7,000 |
| Masterbox (local energy) | 1 ea | 4,212.70 /ea | 4,213 |
| Key (Knox) box | 2 ea | 806.43 /ea | 1,613 |
| Smoke control panel | 1 ea | 19,502.56 /ea | 19,503 |
| Generator monitoring control panel | 1 ea | 571.80 /ea | 572 |
| Fire pump/jockey pump connection | 1 ea | 402.23 /ea | 402 |
| Fire alarm graphic maps | 3 ea | 1,454.56 /ea | 4,364 |
| Fire alarm comissioning | 1 ea | 6,158.00 /ea | 6,158 |
| Fire alarm testing (manufacturer) | 6 ea | 1,338.28 /ea | 8,030 |
| Fire alarm system programming | 397 ea | 20.79 /ea | 8,254 |
| FPLP cable (red) - #14-4/c | 11,475 lf | 2.23 /lf | 25,589 |
| FPLP cable (red) - #16-2/c | 12,330 lf | 1.83 /lf | 22,564 |
| EMT (red) - 3/4"C w/ #16-2/c (exposed) | 2,500 lf | 7.19 /lf | 17,981 |
| EMT (red) - 3/4"C w/ #14-4/c (exposed) | 1,200 lf | 7.95 /lf | 9,535 |
| Circuit integrity cabling (CIC) | 1,500 lf | 18.31 /lf | 27,465 |
| BDA system - parts & smarts (dual-frequency) | 136,600 sf | 0.47 /sf | 64,202 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5030 Communications & Security** | | | |
| BDA system - installation & minor material (dual-frequency) | 136,600 sf | 0.19 /sf | 25,681 |
| Directional couplers | 20 ea | 1,150.35 /ea | 23,007 |
| In-Line connectors | 20 ea | 249.01 /ea | 4,980 |
| Lightning protection units | 5 ea | 1,995.53 /ea | 9,978 |
| **D5030 Communications & Security** | **136,600 sf** | **12.46 /sf** | **1,702,074** |
| **D5090 Other Electrical Systems** | | | |
| LEED Silver - premium (T.B.D.) | 1 ls | 9,400.00 /ls | 9,400 |
| Temp light stringers & GFCI power | 136,600 sf | 0.35 /sf | 47,810 |
| Temp 480Y/277V electrical service (400A) | 3 ea | 18,226.22 /ea | 54,679 |
| Material handling / project mgmt. | 250 mh | 97.71 /mh | 24,428 |
| 3D/BIM coordination | 500 mh | 97.71 /mh | 48,856 |
| Record drawings / as-builts | 1 ea | 5,318.52 /ea | 5,319 |
| Seismic & testing (panels, generator, lighting control, fire alarm) | 1 ls | 18,800.00 /ls | 18,800 |
| Coring - patching - firestopping | 136,600 sf | 0.09 /sf | 12,840 |
| Project phasing (re-mobilization) | 1 ls | 9,400.00 /ls | 9,400 |
| Hoisting & rigging (generator & switchboard) | 2 ls | 7,050.00 /ls | 14,100 |
| Building grounding & bonding | 136,600 sf | 0.11 /sf | 15,408 |
| SPD grounding (internal and external) | 47 ea | 120.29 /ea | 5,653 |
| Dry-type transformer grounding | 4 ea | 213.22 /ea | 853 |
| Copper ground bar - 2"x1/4" (ea.) | 5 ea | 280.03 /ea | 1,400 |
| Natural gas generator: 350kW / 437.5kVA | 1 ea | 133,322.25 /ea | 133,322 |
| Generator testing & start-up | 1 ea | 1,863.20 /ea | 1,863 |
| Generator annunciator panel | 1 ea | 1,447.40 /ea | 1,447 |
| Battery charger circuit (4#10 & 1#10G in 1"C) | 140 lf | 20.94 /lf | 2,932 |
| Jacket heater circuit | 140 lf | 34.49 /lf | 4,828 |
| Oil heater circuit | 140 lf | 53.66 /lf | 7,512 |
| Exterior W.P. sound attenuating enclosure (350kW) | 1 ea | 19,478.75 /ea | 19,479 |
| Remote status panel circuit | 140 lf | 9.64 /lf | 1,349 |
| Starting circuits - 2#14 MI cable | 140 lf | 12.76 /lf | 1,787 |
| Remote annunciator panel - 16#14 (EMT) | 100 lf | 15.81 /lf | 1,581 |
| Quick connect switch, ESL Storm Switch 3020 | 1 ea | 3,668.10 /ea | 3,668 |
| UPS: 480-208/120V, 24kW (static ts,manual by-pass, 8min batt.BU) | 2 ea | 30,061.40 /ea | 60,123 |
| Lightning prevention system subcontractor | 1 ls | 30,000.00 /ls | 30,000 |
| **D5090 Other Electrical Systems** | **136,600 sf** | **3.95 /sf** | **538,839** |
| **D50 Electrical Systems** | **136,600 sf** | **38.05 /sf** | **5,196,968** |
| **D Services** | **136,600 sf** | **120.43 /sf** | **16,451,226** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **E Equipment & Furnishings** | | | |
| **E10 Equipment** | | | |
| **E1020 Institutional Equipment** | | | |
| Loading dock equipment | 1 ls | 1,000.00 /ls | 1,000 |
| Food service equipment - Allowance | 1 ls | 415,270.00 /ls | 415,270 |
| Vocational shop equipment | 1 ls | 25,000.00 /ls | 25,000 |
| ***- Welding booths - In Above*** | - | /- | |
| ***- Portable welding fumes extractor - In Above*** | - | /- | |
| ***- Paint spray hoods - In Above*** | - | /- | |
| ***- Portable wood working equipment dust collector - In HVAC*** | - | /- | |
| Kiln | 1 ls | 12,000.00 /ls | 12,000 |
| Sound systems @ Auditorium - Allowance | 1 allw | 200,000.00 /allw | 200,000 |
| Sound systems @ Gym - Allowance | 1 allw | 120,000.00 /allw | 120,000 |
| Sound systems @ Cafeteria - Allowance | 1 allw | 50,000.00 /allw | 50,000 |
| Sound systems @ Band/Chorus - Allowance | 2 allw | 30,000.00 /allw | 60,000 |
| Sound systems @ Drama - Allowance | 1 allw | 20,000.00 /allw | 20,000 |
| Projection screen @ Gym, Cafeteria | 2 ea | 10,000.00 /ea | 20,000 |
| Projection screen | 1 ea | 5,000.00 /ea | 5,000 |
| ***Orchestra enclosures - FFE*** | - | /- | |
| Theatrical rigging - Allowance | 1 ls | 158,300.00 /ls | 158,300 |
| Theatrical draperies - Allowance | 1 ls | 33,854.00 /ls | 33,854 |
| Theatrical lighting instruments & accessories - Allowance | 1 ls | 129,018.00 /ls | 129,018 |
| Theatrical lighting controls - Allowance | 1 ls | 95,749.00 /ls | 95,749 |
| Basketball backstop - ceiling-hung | 6 ea | 6,500.00 /ea | 39,000 |
| Gym divider curtain - electric roll up | 1,530 sf | 20.00 /sf | 30,600 |
| Athletic wall padding | 835 sf | 12.50 /sf | 10,438 |
| Vollyball system | 1 ls | 5,000.00 /ls | 5,000 |
| Fixed audience seating | 406 ea | 285.00 /ea | 115,710 |
| Retractable Bleachers at Gym | 650 seat | 155.00 /seat | 100,750 |
| **E1020 Institutional Equipment** | **136,600 sf** | **12.06 /sf** | **1,646,689** |
| **E1090 Other Equipment** | | | |
| Refrigerator | 7 ea | 1,200.00 /ea | 8,400 |
| ***Ice maker - None shown*** | - | /- | |
| ***Undercounter refrigerator - None shown*** | - | /- | |
| Microwave oven | 1 ea | 450.00 /ea | 450 |
| Range hood | 1 ea | 650.00 /ea | 650 |
| Range | 1 ea | 900.00 /ea | 900 |
| Dishwasher | 4 ea | 925.00 /ea | 3,700 |
| Washer/dryer - stackable | 2 ea | 1,500.00 /ea | 3,000 |
| Scoreboards - basketball | 1 ea | 7,500.00 /ea | 7,500 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **E1090 Other Equipment** | **136,600 sf** | **0.18 /sf** | **24,600** |
| **E10 Equipment** | **136,600 sf** | **12.24 /sf** | **1,671,288** |
| **E20 Furnishings** | | | |
| **E2010 Fixed Furnishings** | | | |
| Hardwood trim @ locker guardrail per A650 | 3,300 lf | 15.00 /lf | 49,500 |
| P-lam top panels @ locker guardrail per A650 | 1,025 lf | 50.00 /lf | 51,250 |
| P-lam side panels @ locker guardrail per A650 | 450 lf | 50.00 /lf | 22,500 |
| Casework for lockers (bank of 5) - including base | 1,025 lf | 250.00 /lf | 256,250 |
| P-lam base cabinet w/top | 40 lf | 450.00 /lf | 18,000 |
| P-lam workstation w/top | 770 lf | 250.00 /lf | 192,500 |
| Mobile storage | 172 ea | 1,000.00 /ea | 172,000 |
| Mobile storage - VM I05 | (172) ea | 1,000.00 /ea | (172,000) |
| P-lam valance for fin tube | 570 lf | 45.00 /lf | 25,650 |
| P-lam 3/4" lip at counter for fin tube | 570 lf | 4.00 /lf | 2,280 |
| P-lam wall cabinet | 40 lf | 325.00 /lf | 13,000 |
| P-lam full height cabinet | 50 lf | 700.00 /lf | 35,000 |
| Bathroom vanity w/top | 210 lf | 250.00 /lf | 52,500 |
| Reception cabinet | 20 lf | 1,000.00 /lf | 20,000 |
| P-lam circulation desk | 10 lf | 750.00 /lf | 7,500 |
| P-lam work counter @ Admin | 10 lf | 1,500.00 /lf | 15,000 |
| ***P-lam counter @ Servery - In Food Service*** | - | /- | |
| P-lam end/filler panels @ Admin | 10 lf | 135.00 /lf | 1,350 |
| Mailboxes | 18 lf | 415.00 /lf | 7,470 |
| Storage shelving | 380 lf | 150.00 /lf | 57,000 |
| Storage shelving w/MDF | 470 lf | 200.00 /lf | 94,000 |
| P-lam bookcases | 40 lf | 500.00 /lf | 20,000 |
| Built-in benches | 205 lf | 600.00 /lf | 123,000 |
| Free-standing benches | 35 lf | 600.00 /lf | 21,000 |
| Display cases | 5 ea | 4,500.00 /ea | 22,500 |
| ***Misc. casework - N/A*** | - | /- | |
| Misc. lab equipment - Allowance | 1 ls | 25,000.00 /ls | 25,000 |
| Fume hoods | 3 ea | 11,000.00 /ea | 33,000 |
| Fume hoods - 2-sided | 1 ea | 15,000.00 /ea | 15,000 |
| Roller shades | 10,235 sf | 8.00 /sf | 81,880 |
| Roller shades - motorized | 970 sf | 18.00 /sf | 17,460 |
| Roller shades - interior | 3,300 sf | 8.00 /sf | 26,400 |
| Roller shades - doors | 50 ea | 150.00 /ea | 7,500 |
| Base cabinet w/epoxy top | 30 lf | 600.00 /lf | 18,000 |
| Epoxy countertop - open below | 325 lf | 375.00 /lf | 121,875 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **E2010 Fixed Furnishings** | | | |
| Epoxy backsplash | 635 lf | 60.00 /lf | 38,100 |
| Wall cabinets | 105 lf | 400.00 /lf | 42,000 |
| **E2010 Fixed Furnishings** | **136,600 sf** | **11.23 /sf** | **1,533,465** |
| **E20 Furnishings** | **136,600 sf** | **11.23 /sf** | **1,533,465** |
| **E Equipment & Furnishings** | **136,600 sf** | **23.46 /sf** | **3,204,754** |
| **F Special Construction & Demolition** | | | |
| **F20 Demolition** | | | |
| **F2010 Building Elements Demolition** | | | |
| Building demolition | 195,400 sf | 7.00 /sf | 1,367,800 |
| **F2010 Building Elements Demolition** | **194,500 sf** | **7.03 /sf** | **1,367,800** |
| **F2020 Hazardous Component Abatement** | | | |
| Asbestos abatement | 195,400 sf | 8.20 /sf | 1,602,280 |
| **F2020 Hazardous Component Abatement** | **194,500 sf** | **8.24 /sf** | **1,602,280** |
| **F20 Demolition** | **194,500 sf** | **15.27 /sf** | **2,970,080** |
| **F Special Construction & Demolition** | **194,500 sf** | **15.27 /sf** | **2,970,080** |
| **G Sitework** | | | |
| **G10 Site Preparation** | | | |
| **G1010 Site Clearing** | | | |
| ***Mobilizations*** | ***BP#1*** | ***/BP#1*** | |
| ***Survey/layout*** | ***BP#1*** | ***/BP#1*** | |
| ***Police details*** | ***BP#1*** | ***/BP#1*** | |
| ***Precast Concrete Jersey Barriers for Temp. Parking Lot*** | ***BP#1*** | ***/BP#1*** | |
| ***Temporary site signage*** | ***BP#1*** | ***/BP#1*** | |
| ***As-built plan preparation*** | ***BP#1*** | ***/BP#1*** | |
| ***Localized dewatering*** | ***BP#1*** | ***/BP#1*** | |
| ***Clear & grub, vegetation removal*** | ***BP#1*** | ***/BP#1*** | |
| ***Strip & stockpile topsoil/loam*** | ***BP#1*** | ***/BP#1*** | |
| ***Construct Phase 2 Temp. Sediment Basins*** | ***BP#1*** | ***/BP#1*** | |
| ***SWPPP (Prep of SWPPP by civil engineer)*** | ***BP#1*** | ***/BP#1*** | |
| ***12"diameter Straw Wattles*** | ***BP#1*** | ***/BP#1*** | |
| ***Silt sacks at catch basin*** | ***BP#1*** | ***/BP#1*** | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **G1010 Site Clearing** | | | |
| ***Construction entrance*** | ***BP#1*** | ***/BP#1*** | |
| ***Street sweeping*** | ***BP#1*** | ***/BP#1*** | |
| ***Inspect / repair silt barrier weekly*** | ***BP#1*** | ***/BP#1*** | |
| ***Remove erosion control measure at project completion*** | ***BP#1*** | ***/BP#1*** | |
| ***Asphalt paving - Temp. Parking Layout*** | ***BP#1*** | ***/BP#1*** | |
| ***Temporary roads and maintenance required during construction*** | ***BP#1*** | ***/BP#1*** | |
| **G1010 Site Clearing** | **136,600 sf** | **/sf** | |
| **G1020 Site Demolition & Relocations** | | | |
| ***Demo hydrants*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo bituminous concrete paving*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo bituminous walk*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo Temporary Bituminous Parking & Access Pavement*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo concrete sidewalks/pads/ramps*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo curbing*** | ***BP#1*** | ***/BP#1*** | |
| ***Cut & cap site utilities - water*** | ***BP#1*** | ***/BP#1*** | |
| ***Cut & cap site utilities - sewer*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo utility piping - water*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo utility piping - sewer*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo utility piping - electrical*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo utility piping - drain*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo utility piping - gas*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo drain structures*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo grease trap*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo fencing/guardrail*** | ***BP#1*** | ***/BP#1*** | |
| ***Misc. site demolition*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo utility poles*** | ***BP#1*** | ***/BP#1*** | |
| Flag pole | 1 ea | 9,000.00 /ea | 9,000 |
| **G1020 Site Demolition & Relocations** | **136,600 sf** | **0.07 /sf** | **9,000** |
| **G1030 Site Earthwork** | | | |
| ***Preconstruction survey and vibration monitoring & compliance*** | ***BP#1*** | ***/BP#1*** | |
| ***Rough grading*** | ***BP#1*** | ***/BP#1*** | |
| ***Fine grading - building SOG*** | ***BP#1*** | ***/BP#1*** | |
| ***Fine grading - paving*** | ***BP#1*** | ***/BP#1*** | |
| ***Fine grading - conc walks & site pads*** | ***BP#1*** | ***/BP#1*** | |
| ***Fine grading - bituminous walks*** | ***BP#1*** | ***/BP#1*** | |
| ***Cut to subgrade @ site*** | ***BP#1*** | ***/BP#1*** | |
| ***Fill to subgrade from cut @ site*** | ***BP#1*** | ***/BP#1*** | |
| ***Grind foundations for fill - In Demolition*** | ***-*** | ***/-*** | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **G1030 Site Earthwork** | | | |
| ***Fill to subgrade @ site - import*** | ***BP#1*** | ***/BP#1*** | |
| ***Site cuts to stockpile for temporary parking & access layout*** | ***BP#1*** | ***/BP#1*** | |
| ***Site surcharge*** | ***BP#1*** | ***/BP#1*** | |
| ***Contaminated soil removal - unlined landfill*** | ***BP#1*** | ***/BP#1*** | |
| ***Rock removal - NIC*** | ***-*** | ***/-*** | |
| Import loam & spread (6") at Lawns, Athletic Fields & Native Meadows | 5,594 cy | 40.00 /cy | 223,760 |
| Ammend & spread (6") at Lawns, Athletic Fields & Native Meadows | 6,030 cy | 12.00 /cy | 72,360 |
| Import loam & spread (6") at Detention Basins | 802 cy | 40.00 /cy | 32,080 |
| Import loam & spread (12") at Plant Beds | 375 cy | 40.00 /cy | 15,000 |
| Landscape Metal Edging at Building Mow Strip | 2,330 lf | 15.00 /lf | 34,950 |
| Building Mowing Strip- (Peastone) | 100 tn | 50.00 /tn | 5,000 |
| Import loam & spread (6") at Sodded Amphlitheather Lawns | 691 cy | 40.00 /cy | 27,640 |
| **G1030 Site Earthwork** | **136,600 sf** | **3.01 /sf** | **410,790** |
| **G10 Site Preparation** | **136,600 sf** | **3.07 /sf** | **419,790** |
| **G20 Site Improvements** | | | |
| **G2010 Roadways** | | | |
| ***Street plates for protection*** | ***BP#1*** | ***/BP#1*** | |
| **G2010 Roadways** | **136,600 sf** | **/sf** | |
| **G2020 Parking Lots** | | | |
| ***Gravel base course @ asphalt pavements*** | ***BP#1*** | ***/BP#1*** | |
| ***Gravel base course @ Raised Stamped asphalt pavement at Flagg Drive*** | ***BP#1*** | ***/BP#1*** | |
| ***1 1/2" crushed stone base course - concrete walks & site pads*** | ***BP#1*** | ***/BP#1*** | |
| ***Asphalt paving - (Parking Lots & Site Drives)*** | ***BP#1*** | ***/BP#1*** | |
| ***Asphalt paving - top course @ temporary to permanent*** | ***BP#1*** | ***/BP#1*** | |
| ***Precast concrete curbs*** | ***BP#1*** | ***/BP#1*** | |
| ***Vertical granite curbs*** | ***BP#1*** | ***/BP#1*** | |
| ***Handicapped ramps at curbing*** | ***BP#1*** | ***/BP#1*** | |
| ***Detectable Warning Plates at Handicapped Ramps*** | ***BP#1*** | ***/BP#1*** | |
| ***Speed bumps - bituminous*** | ***BP#1*** | ***/BP#1*** | |
| ***Pavement markings*** | ***BP#1*** | ***/BP#1*** | |
| ***Parking signage*** | ***BP#1*** | ***/BP#1*** | |
| **G2020 Parking Lots** | **136,600 sf** | **/sf** | |
| **G2030 Pedestrian Paving** | | | |
| ***Processed Aggregate base course - bituminous walks*** | ***BP#1*** | ***/BP#1*** | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **G2030 Pedestrian Paving** | | | |
| ***Concrete pavement*** | ***BP#2*** | ***/BP#2*** | |
| ***Steps - premium*** | ***BP#2*** | ***/BP#2*** | |
| ***Dumpster pad*** | ***BP#2*** | ***/BP#2*** | |
| ***Concrete pavement with sawcut joints*** | ***BP#2*** | ***/BP#2*** | |
| ***Stamped pavement at Flagg Drive*** | ***BP#1*** | ***/BP#1*** | |
| Pavers - plaza paving | 745 sf | 25.00 /sf | 18,625 |
| Stone Dust at Raised Planter | 32 sf | 20.00 /sf | 640 |
| ***Bituminous sidewalks*** | ***BP#1*** | ***/BP#1*** | |
| **G2030 Pedestrian Paving** | **136,600 sf** | **0.14 /sf** | **19,265** |
| **G2040 Site Development** | | | |
| ***Retaining footing*** | ***BP#2*** | ***/BP#2*** | |
| ***Retaining wall*** | ***BP#2*** | ***/BP#2*** | |
| ***Concrete bench/seat wall*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel @ Bandshell - AESS*** | ***BP#2*** | ***/BP#2*** | |
| Guardrails - exterior, colorgalv | 240 lf | 325.00 /lf | 78,000 |
| Phenolic bench per A102A | 1 ea | 4,200.00 /ea | 4,200 |
| Glass @ Bandshell (vertical) - 9/16" tempered, laminated | 235 sf | 150.00 /sf | 35,250 |
| Glass @ Bandshell (roof) - 9/16" tempered, laminated | 300 sf | 150.00 /sf | 45,000 |
| Prep/paint Bandshell | 1 ls | 10,000.00 /ls | 10,000 |
| Prep/paint main and West Admin egress canopies | 1 ls | 10,000.00 /ls | 10,000 |
| Exterior signage | 1 ls | 25,000.00 /ls | 25,000 |
| Wood benches | 20 lf | 750.00 /lf | 15,000 |
| Bicycle Racks | 20 ea | 785.00 /ea | 15,700 |
| Basketball Poles & Hoops | 2 ea | 8,000.00 /ea | 16,000 |
| Miscellaneous site furnishings - Allowance | 1 ls | 30,000.00 /ls | 30,000 |
| ***Gravel base course - misc site amenities- (i.e.- curbing, swales,etc.)*** | ***BP#1*** | ***/BP#1*** | |
| ***Basketball Court Pavement- (3 1/2" Total Paving w/ Gravel Base) - BP#1*** | ***sf*** | ***/sf*** | |
| Basketball Court Pavement Markings | 1 ls | 2,000.00 /ls | 2,000 |
| ***Wooden Guardrailing*** | ***BP#1*** | ***/BP#1*** | |
| ***Fencing - N/A*** | ***-*** | ***/-*** | |
| 24' wide Single Arm Gate | 1 ea | 3,500.00 /ea | 3,500 |
| ***Wooden Guardrailing - BP#1*** | ***lf*** | ***/lf*** | |
| ***Bollards - 6" steel w/concrete - BP#1*** | ***BP#1*** | ***/BP#1*** | |
| ***Bollards - 6" steel w/concrete - BP#1*** | ***ea*** | ***/ea*** | |
| ***Bollards - architectural*** | ***0 ea*** | ***/ea*** | |
| Segmental retaining wall | 2,600 sf | 50.00 /sf | 130,000 |
| Additional segmental retaining wall per PR #12 | 220 sf | 50.00 /sf | 11,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **G2040 Site Development** | **136,600 sf** | **3.15 /sf** | **430,650** |
| **G2050 Landscaping** | | | |
| Landscaping maintenance | 1 yr | 8,000.00 /yr | 8,000 |
| ***Irrigation system @ south sports field - by others*** | - | /- | |
| Irrigation @ ampitheater - Allowance | 23,435 sf | 2.00 /sf | 46,870 |
| Irrigation system @ north sports field - Allowance | 81,000 sf | 2.00 /sf | 162,000 |
| Mulch at trees and planting beds (3") | 240 cy | 105.00 /cy | 25,200 |
| Fine grade & hydroseed lawn areas | 119,420 sf | 0.30 /sf | 35,826 |
| Fine grade & seed (Native Wildflower Meadow) | 104,005 sf | 0.25 /sf | 26,001 |
| Fine grade & seed (Detention Basin Mix- Hydroseed) | 33,330 sf | 0.25 /sf | 8,333 |
| Fine grade & seed (Natural Turf Fields) | 259,269 sf | 0.25 /sf | 64,817 |
| Sod (Amphiltheather Lawns) | 28,719 sf | 1.50 /sf | 43,079 |
| Sod (100'x170') - Temporary | 17,000 sf | 1.50 /sf | 25,500 |
| Sod northeast - Phase 3 play area, temporary | 5,000 sf | 1.50 /sf | 7,500 |
| Watering for sod areas - Fields | 1 ls | 7,500.00 /ls | 7,500 |
| Watering for sod areas - Amphitheater | 1 ls | 7,500.00 /ls | 7,500 |
| Trees | 118 ea | 750.00 /ea | 88,500 |
| Shrubs (478 Total) | 7,736 sf | 8.50 /sf | 65,756 |
| Groundcover/perennials | 1,966 ea | 20.00 /ea | 39,320 |
| Plantings @ planter beds | 1 ls | 20,000.00 /ls | 20,000 |
| ***Rain garden - N/A*** | - | /- | |
| **G2050 Landscaping** | **136,600 sf** | **4.99 /sf** | **681,702** |
| **G20 Site Improvements** | **136,600 sf** | **8.28 /sf** | **1,131,617** |
| **G30 Site Civil/Mechanical Utilites** | | | |
| **G3010 Water Supply** | | | |
| ***Fire hydrants*** | ***BP#1*** | ***/BP#1*** | |
| ***Fire hydrant - relocate existing*** | ***BP#1*** | ***/BP#1*** | |
| ***Gate valves, tees, bends, thrust blocks, restraints*** | ***BP#1*** | ***/BP#1*** | |
| ***Water distribution  connections to existing*** | ***BP#1*** | ***/BP#1*** | |
| ***Water line - domestic*** | ***BP#1*** | ***/BP#1*** | |
| ***Water line - hydrant & fire services*** | ***BP#1*** | ***/BP#1*** | |
| ***Pressure test & chlorinate*** | ***BP#1*** | ***/BP#1*** | |
| **G3010 Water Supply** | **136,600 sf** | **/sf** | |
| **G3020 Sanitary Sewer** | | | |
| ***Sanitary sewer piping*** | ***BP#1*** | ***/BP#1*** | |
| ***Sanitary sewer manholes*** | ***BP#1*** | ***/BP#1*** | |
| ***Connect to existing structures*** | ***BP#1*** | ***/BP#1*** | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **G3020 Sanitary Sewer** | | | |
| ***Utility and sewer tie-in at trailer*** | ***BP#1*** | ***/BP#1*** | |
| ***Sanitary sewer testing - piping*** | ***BP#1*** | ***/BP#1*** | |
| ***Video inspect incoming sewer, etc.*** | ***BP#1*** | ***/BP#1*** | |
| ***Sanitary sewer testing - structures*** | ***BP#1*** | ***/BP#1*** | |
| ***Grease interceptor - In Plumbing*** | ***-*** | ***/-*** | |
| ***Acid Neutralization - In Plumbing*** | ***-*** | ***/-*** | |
| **G3020 Sanitary Sewer** | **136,600 sf** | **/sf** | |
| **G3030 Storm Drainage** | | | |
| ***Catch basins*** | ***BP#1*** | ***/BP#1*** | |
| ***Granite Curb Inlets*** | ***BP#1*** | ***/BP#1*** | |
| ***Storm drainage manholes*** | ***BP#1*** | ***/BP#1*** | |
| ***Outlet control structures*** | ***BP#1*** | ***/BP#1*** | |
| ***Storm headwalls*** | ***BP#1*** | ***/BP#1*** | |
| ***Stormceptors*** | ***BP#1*** | ***/BP#1*** | |
| ***Storm drainage piping*** | ***BP#1*** | ***/BP#1*** | |
| ***Rip Rap Splash Pads*** | ***BP#1*** | ***/BP#1*** | |
| ***Weir Overflows*** | ***BP#1*** | ***/BP#1*** | |
| ***Check dams*** | ***BP#1*** | ***/BP#1*** | |
| ***Foundation drainage piping*** | ***BP#1*** | ***/BP#1*** | |
| ***Infiltration system*** | ***BP#1*** | ***/BP#1*** | |
| **G3030 Storm Drainage** | **136,600 sf** | **/sf** | |
| **G3060 Fuel Distribution** | | | |
| ***Excavation / backfill for gas line*** | ***BP#1*** | ***/BP#1*** | |
| **G3060 Fuel Distribution** | **136,600 sf** | **/sf** | |
| **G30 Site Civil/Mechanical Utilites** | **136,600 sf** | **/sf** | |
| **G40 Site Electrical Utilities** | | | |
| **G4010 Electrical Distribution** | | | |
| Temp power for welders | 2 ea | 2,398.27 /ea | 4,797 |
| Temp power for trailers | 4 ea | 1,302.42 /ea | 5,210 |
| Temp internet connection for trailers | 4 ea | 1,854.17 /ea | 7,417 |
| Feeder (PVC/CU) - 150A [generator / LS] | 135 lf | 22.18 /lf | 2,994 |
| Feeder (PVC/CU) - 225A [generator / OS] | 135 lf | 33.46 /lf | 4,517 |
| Feeder (PVC/CU) - 400A [generator / LR] (exterior) | 135 lf | 56.93 /lf | 7,685 |
| Feeder (PVC/CU) - 2500A [secondary] | 105 lf | 414.00 /lf | 43,470 |
| Empty conduit - sch 40 PVC: 1 x 4" [generator] | 135 lf | 9.86 /lf | 1,330 |
| Empty conduit - sch 40 PVC: 1 x 4" [secondary / spare] | 105 lf | 9.86 /lf | 1,035 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **G4010 Electrical Distribution** | | | |
| Empty conduit - sch 40 PVC: 2 x 4" [primary] | 250 lf | 17.66 /lf | 4,415 |
| Magnetic warning tape - 1/8" | 875 lf | 4.37 /lf | 3,826 |
| Pole riser (GRC - 4"C) | 2 ea | 2,343.85 /ea | 4,688 |
| Electric manhole - 6'x12x7' | 1 ea | 6,773.56 /ea | 6,774 |
| Cast iron manhole frame/cover, 32"D x 6'H grade rings | 1 ea | 1,140.93 /ea | 1,141 |
| 12" x 12" x 12"D ground mounted pullbox (Quazite #PC1212HG00 w/ Cover) | 2 ea | 752.15 /ea | 1,504 |
| Hand hole & cover - 4'x4'x4' | 6 ea | 1,937.11 /ea | 11,623 |
| 17"x30"x12"D ground pullbox (Quazite #PC1730BA12 w/ cover) | 11 ea | 1,078.60 /ea | 11,865 |
| 24" x 36" x 24"D ground mounted pullbox (Quazite #Pg2436BC-24 w/ Cover) | 1 ea | 1,718.39 /ea | 1,718 |
| Manhole / racking grounding & bonding | 1 ea | 701.05 /ea | 701 |
| Exterior (utility) transformer grounding & bonding | 1 ea | 1,066.05 /ea | 1,066 |
| Generator grounding & bonding | 1 ea | 1,066.05 /ea | 1,066 |
| Bare copper wire - #4/0 [duct bank] | 875 lf | 4.99 /lf | 4,368 |
| Electric vehicle charging station / dual pedestal / cable mgmt. | 3 ea | 10,512.40 /ea | 31,537 |
| Utility meter socket (meter by Util. Co.) | 1 ea | 289.66 /ea | 290 |
| CT meter enclosure for switchboard | 1 ea | 1,462.26 /ea | 1,462 |
| ***Excavation/backfill for Emergency Generator ductbank*** | ***BP#1*** | ***/BP#1*** | |
| ***Excavation/backfill for Primary Electric ductbank*** | ***BP#1*** | ***/BP#1*** | |
| ***Excavation/backfill for Fire Alarm ductbank*** | ***BP#1*** | ***/BP#1*** | |
| ***Excavation/backfill for Telcom ductbank*** | ***BP#1*** | ***/BP#1*** | |
| ***Excavation/backfill for U.G. ductbank*** | ***BP#1*** | ***/BP#1*** | |
| ***Excavation/backfill for 2"C Power Data ductbank (Amphitheather)*** | ***BP#1*** | ***/BP#1*** | |
| ***Excavation/backfill for 2"C to IDF ductbank*** | ***BP#1*** | ***/BP#1*** | |
| ***Concrete and rebar for electrical/telcom ductbanks*** | ***BP#1*** | ***/BP#1*** | |
| ***6" Concrete Filled Steel Pipe Bollards at Generator & Transformer Pads*** | ***BP#1*** | ***/BP#1*** | |
| **G4010 Electrical Distribution** | **136,600 sf** | **1.22 /sf** | **166,498** |
| **G4020 Site Lighting** | | | |
| Remove existing exterior site light fixture | 11 ea | 672.85 /ea | 7,401 |
| Lighting contactor - 12 pole (exterior lighting) | 1 ea | 1,899.98 /ea | 1,900 |
| SL5: exterior ampitheater RGB projector, DMX capable, IP65 rated [O] | 8 ea | 3,626.85 /ea | 29,015 |
| SLS: LED recessed step light, 0-10V dimming capable [C] | 7 ea | 732.90 /ea | 5,130 |
| SL1: LED pole mounted luminaires mounted on a 20' pole [O] | 35 ea | 2,891.40 /ea | 101,199 |
| SL2A: exterior post top fixture with 15' round tapered alum pole [O] | 13 ea | 5,492.50 /ea | 71,403 |
| SL3: exterior bollard 43.3 cast illuminum [O] | 9 ea | 1,929.78 /ea | 17,368 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **G4020 Site Lighting** | | | |
| SL10: LED mini in-ground flood fixture capable of 0-10V dimming [O] | 12 ea | 978.60 /ea | 11,743 |
| EMT (12/2) - 20A | 1,400 lf | 7.13 /lf | 9,981 |
| 1" PVC - 30A (3#8 & #10G) | 6,900 lf | 10.95 /lf | 75,528 |
| 1" GRC - 90 Deg Sweep | 114 ea | 174.22 /ea | 19,861 |
| ***Emergency Call Box base*** | ***BP#1*** | ***/BP#1*** | |
| ***EV Parking Station bases*** | ***BP#1*** | ***/BP#1*** | |
| ***Light pole bases*** | ***BP#1*** | ***/BP#1*** | |
| **G4020 Site Lighting** | **136,600 sf** | **2.57 /sf** | **350,530** |
| **G4030 Site Communications & Security** | | | |
| Relocate existing emergency call box (provide new concrete base) | 1 ea | 2,994.80 /ea | 2,995 |
| Empty conduit (PVC) - 1" | 250 lf | 8.07 /lf | 2,016 |
| Empty conduit (PVC) - 2" | 700 lf | 6.03 /lf | 4,223 |
| Empty conduit (sch 40 PVC) (4) 4"C (CATV, Telephone, FIber, Spare) | 220 lf | 32.32 /lf | 7,110 |
| Three (3) 1.25" inner ducts for fiber | 220 lf | 15.50 /lf | 3,411 |
| Communications utility pole conduit riser (GRC - 4"C) | 4 ea | 2,343.84 /ea | 9,375 |
| Telecom manhole & cover - 4'x6'x7' | 1 ea | 3,920.36 /ea | 3,920 |
| 360-degree multi-sensor exterior cameras mounted on poles | 3 ea | 4,509.56 /ea | 13,529 |
| Camera wiring (PVC) | 600 lf | 13.34 /lf | 8,003 |
| Ductbank w/ IMSA cable - 2" PVC | 320 lf | 16.30 /lf | 5,217 |
| ***Excavation/backfill for site lighting*** | ***BP#1*** | ***/BP#1*** | |
| **G4030 Site Communications & Security** | **136,600 sf** | **0.44 /sf** | **59,799** |
| **G40 Site Electrical Utilities** | **136,600 sf** | **4.22 /sf** | **576,826** |
| **G Sitework** | **136,600 sf** | **15.58 /sf** | **2,128,233** |

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| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| 01-54 SCAFFOLDING | 136,600 sf | 0.55 /sf | 75,000 |
| 02-20 SELECTIVE DEMOLITION | 136,600 sf | 10.01 /sf | 1,367,800 |
| 02-82 HAZARDOUS MATERIAL ABATEMENT | 136,600 sf | 11.73 /sf | 1,602,280 |
| 03-30 CONCRETE | 136,600 sf | /sf | |
| 03-45 POLISHED CONCRETE | 136,600 sf | /sf | |
| 04-20 MASONRY (TS) | 136,600 sf | 16.77 /sf | 2,290,785 |
| 05-12 STRUCTURAL STEEL | 136,600 sf | /sf | |
| 05-50 MISCELLANEOUS METALS (TS) | 136,600 sf | 8.15 /sf | 1,112,650 |
| 06-25 FINISH CARPENTRY | 136,600 sf | 14.13 /sf | 1,929,625 |
| 07-10 WATERPROOFING & JOINT SEALANTS (TS) | 136,600 sf | 5.30 /sf | 723,860 |
| 07-42 METAL/COMPOSITE PANELS & SIDING | 136,600 sf | 8.79 /sf | 1,201,245 |
| 07-50 MEMBRANE ROOFING (TS) | 136,600 sf | 11.07 /sf | 1,512,408 |
| 07-81 FIREPROOFING | 136,600 sf | 2.94 /sf | 401,945 |
| 08-10 DOORS, FRAMES & HARDWARE | 136,600 sf | 5.21 /sf | 711,550 |
| 08-34 OVERHEAD DOORS & GRILLES | 136,600 sf | 0.55 /sf | 74,750 |
| 08-41 ALUMINUM STOREFRONT & WINDOWS (TS) | 136,600 sf | 17.68 /sf | 2,415,350 |
| 08-45 TRANSLUCENT PANEL SYSTEMS | 136,600 sf | /sf | |
| 08-80 GLASS & GLAZING (TS) | 136,600 sf | 7.40 /sf | 1,010,875 |
| 08-90 LOUVERS | 136,600 sf | 0.39 /sf | 53,125 |
| 09-21 DRYWALL | 136,600 sf | 46.10 /sf | 6,297,346 |
| 09-30 TILE (TS) | 136,600 sf | 1.61 /sf | 219,185 |
| 09-51 ACOUSTICAL CEILINGS (TS) | 136,600 sf | 6.62 /sf | 903,664 |
| 09-64 WOOD FLOORING | 136,600 sf | 1.55 /sf | 211,650 |
| 09-65 RESILIENT FLOORING (TS) | 136,600 sf | 6.19 /sf | 845,813 |
| 09-67 RESINOUS FLOORING | 136,600 sf | 0.59 /sf | 80,920 |
| 09-68 CARPET | 136,600 sf | 0.17 /sf | 23,475 |
| 09-90 PAINTING (TS) | 136,600 sf | 3.85 /sf | 525,823 |
| 10-14 SIGNAGE | 136,600 sf | 0.53 /sf | 72,810 |
| 10-24 OPERABLE PARTITIONS | 136,600 sf | 2.15 /sf | 293,545 |
| 10-51 LOCKERS | 136,600 sf | 3.05 /sf | 416,260 |
| 10-95 MISCELLANEOUS SPECIALTIES | 136,600 sf | 2.84 /sf | 387,827 |
| 11-31 RESIDENTIAL APPLIANCES | 136,600 sf | 0.13 /sf | 17,100 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| 11-40 FOOD SERVICE EQUIPMENT | 136,600 sf | 3.04 /sf | 415,270 |
| 11-51 AUDIO-VISUAL EQUIPMENT | 136,600 sf | 3.29 /sf | 450,000 |
| 11-61 THEATER & STAGE EQUIPMENT | 136,600 sf | 3.05 /sf | 416,921 |
| 11-65 ATHLETIC/RECREATIONAL EQUIPMENT | 136,600 sf | 0.68 /sf | 92,538 |
| 11-95 VOCATIONAL SHOP EQUIPMENT | 136,600 sf | 0.27 /sf | 37,000 |
| 12-20 WINDOW TREATMENTS | 136,600 sf | 0.98 /sf | 133,240 |
| 12-35 LAB CASEWORK | 136,600 sf | 2.15 /sf | 292,975 |
| 12-60 FIXED AUDITORIUM SEATING | 136,600 sf | 0.85 /sf | 115,710 |
| 12-62 BLEACHERS | 136,600 sf | 0.74 /sf | 100,750 |
| 14-20 ELEVATORS (TS) | 136,600 sf | 1.61 /sf | 220,000 |
| 21-01 FIRE PROTECTION (TS) | 136,600 sf | 6.40 /sf | 873,859 |
| 22-01 PLUMBING (TS) | 136,600 sf | 14.89 /sf | 2,033,274 |
| 23-01 HVAC (TS) | 136,600 sf | 59.49 /sf | 8,126,676 |
| 26-01 ELECTRICAL (TS) | 136,600 sf | 42.27 /sf | 5,773,794 |
| 31-23 SITEWORK | 136,600 sf | /sf | |
| 32-10 LANDSCAPING & SITE IMPROVEMENTS | 136,600 sf | 9.81 /sf | 1,340,457 |
| 32-31 FENCING | 136,600 sf | 0.03 /sf | 3,500 |

## Estimate Totals

| Description | Amount | Totals | Rate | Cost per Unit |
|---|---|---|---|---|
| Subtotal | **47,204,628** | **47,204,628** | | **345.57 /sf** |
| Design/Estimate Contingency | 1,416,139 | | 3.000 % | 10.37 /sf |
| Escalation | 486,208 | | 1.000 % | 3.56 /sf |
| **Subtotal** | **1,902,347** | **49,106,975** | | **359.49 /sf** |
| SDI (Non-Trade Contracts) | 260,633 | | 1.400 % | 1.91 /sf |
| Sub Bonds (Trade Contracts) | 400,232 | | 1.400 % | 2.93 /sf |
| Contractor's Contingency | 1,244,196 | | 2.500 % | 9.11 /sf |
| General Conditions | 2,931,033 | | | 21.46 /sf |
| General Requirements | 2,289,380 | | | 16.76 /sf |
| **Subtotal** | **7,125,474** | **56,232,449** | | **411.66 /sf** |
| Builder's Risk Insurance - BP1 | | | | |
| General Liability Insurance | 576,109 | | | 4.22 /sf |
| Building Permit - NIC | | | | |
| Performance & Payment Bond | | | | |
| **Subtotal** | **576,109** | **56,808,558** | | **415.88 /sf** |
| Fee | 1,152,218 | | | 8.43 /sf |
| Amendment #1 - Sitework | 10,957,843 | | | 80.22 /sf |
| - Addendum #3: Delete Traffic Table | (195,200) | | | (1.43) /sf |
| - Addendum #3: Reduced Fill at Amphitheater | (18,000) | | | (0.13) /sf |
| Amendment #2 - Concrete & Steel | 8,738,800 | | | 63.97 /sf |
| Amendment #2 - Buy Savings | (50,755) | | | (0.37) /sf |
| **Total** | | **77,393,464** | | **566.57 /sf** |

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| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **01-54 SCAFFOLDING** | | | |
| **01.54.23 Temporary Scaffolding & Platforms** | | | |
| Dance floor at auditorium - multi-trade | 1 ls | 75,000.00 /ls | 75,000 |
| **Temporary Scaffolding & Platforms** | **136,600 sf** | **0.55 /sf** | **75,000** |
| **01-54 SCAFFOLDING** | **136,600 sf** | **0.55 /sf** | **75,000** |
| **02-20 SELECTIVE DEMOLITION** | | | |
| **02.41.01 Demolition - General** | | | |
| Building demolition | 195,400 sf | 7.00 /sf | 1,367,800 |
| **Demolition - General** | **136,600 sf** | **10.01 /sf** | **1,367,800** |
| **02-20 SELECTIVE DEMOLITION** | **136,600 sf** | **10.01 /sf** | **1,367,800** |
| **02-82 HAZARDOUS MATERIAL ABATEMENT** | | | |
| **02.82.00 Asbestos Remediation** | | | |
| Asbestos abatement | 195,400 sf | 8.20 /sf | 1,602,280 |
| **Asbestos Remediation** | **136,600 sf** | **11.73 /sf** | **1,602,280** |
| **02-82 HAZARDOUS MATERIAL ABATEMENT** | **136,600 sf** | **11.73 /sf** | **1,602,280** |
| **03-30 CONCRETE** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Concrete) | (1) ls | 116,000.00 /ls | (116,000) |
| Trade support - lull, laborer for cleanup (Concrete) | 1 ls | 116,000.00 /ls | 116,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **03.11.50 Concrete Forming - Flatwork** | | | |
| ***Slab depressions*** | ***BP#2*** | ***/BP#2*** | |
| **Concrete Forming - Flatwork** | **135,589 sf** | **/sf** | |
| **03.11.75 Concrete Forming - Pits** | | | |
| ***Elevator pit*** | ***BP#2*** | ***/BP#2*** | |
| **Concrete Forming - Pits** | **136,600 sf** | **/sf** | |
| **03.31.10 Concrete Ready Mix - Site** | | | |
| ***Retaining footing*** | ***BP#2*** | ***/BP#2*** | |
| ***Retaining wall*** | ***BP#2*** | ***/BP#2*** | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **03.31.10 Concrete Ready Mix - Site** | | | |
| *Concrete bench/seat wall* | *BP#2* | */BP#2* | |
| **Concrete Ready Mix - Site** | **136,600 sf** | **/sf** | |
| **03.31.20 Concrete Ready Mix - Foundations** | | | |
| *F3 spread footings* | *BP#2* | */BP#2* | |
| *F4 spread footings* | *BP#2* | */BP#2* | |
| *F5 spread footings* | *BP#2* | */BP#2* | |
| *F6 spread footings* | *BP#2* | */BP#2* | |
| *F7 spread footings* | *BP#2* | */BP#2* | |
| *F8 spread footings* | *BP#2* | */BP#2* | |
| *F9 spread footings* | *BP#2* | */BP#2* | |
| *F10 spread footings* | *BP#2* | */BP#2* | |
| *F11 spread footings* | *BP#2* | */BP#2* | |
| *F12 spread footings* | *BP#2* | */BP#2* | |
| *Continuous footings - 3'x12"* | *BP#2* | */BP#2* | |
| *Continuous footings - 4'x12"* | *BP#2* | */BP#2* | |
| *Continuous footings - 5'x12" @ Bandshell* | *BP#2* | */BP#2* | |
| *Foundation walls - 16"* | *BP#2* | */BP#2* | |
| *Foundation walls - 16" @ Bandshell* | *BP#2* | */BP#2* | |
| *Foundation walls - 21"* | *BP#2* | */BP#2* | |
| *Retaining walls - 16"* | *BP#2* | */BP#2* | |
| *Concrete walls @ Auditorium* | *BP#2* | */BP#2* | |
| *Piers - 24"x24"* | *BP#2* | */BP#2* | |
| *Grade beam 1* | *BP#2* | */BP#2* | |
| *Grade beam 2* | *BP#2* | */BP#2* | |
| **Concrete Ready Mix - Foundations** | **136,600 sf** | **/sf** | |
| **03.31.50 Concrete Ready Mix - Flatwork** | | | |
| *Slab on grade - 5"* | *BP#2* | */BP#2* | |
| **Concrete Ready Mix - Flatwork** | **136,600 sf** | **/sf** | |
| **03.35.55 Concrete Finishing - Slabs-on-Grades** | | | |
| *Power trowel/seal concrete @ Auditorium* | *BP#2* | */BP#2* | |
| **Concrete Finishing - Slabs-on-Grades** | **136,600 sf** | **/sf** | |
| **03.35.60 Concrete Finishing - Slabs-on-Decking** | | | |
| *Place & finish slabs - 2-1/2" on 3" deck @ roof* | *BP#2* | */BP#2* | |
| *Place & finish slabs - 3-1/4" on 3" deck @ floor (LW)* | *BP#2* | */BP#2* | |
| *Topping slab @ Breakout LGMF floors* | *BP#2* | */BP#2* | |
| *Place & finish slabs - 3-1/4" on 3" deck @ roof* | *BP#2* | */BP#2* | |

| Description | Takeoff Quantity | | Total Cost/Unit | | Total Amount |
|---|---|---|---|---|---|
| **Concrete Finishing - Slabs-on-Decking** | **136,600** | **sf** | | **/sf** | |
| **03.35.90 Concrete Finishing - Miscellaneous** | | | | | |
| ***Place & finish stair treads/landings*** | | ***BP#2*** | | ***/BP#2*** | |
| **Concrete Finishing - Miscellaneous** | **136,600** | **sf** | | **/sf** | |
| **03.36.00 Miscellaneous Concrete Items** | | | | | |
| ***Underslab insulation (perimeter only)*** | | ***BP#2*** | | ***/BP#2*** | |
| ***Foundation wall insulation*** | | ***BP#2*** | | ***/BP#2*** | |
| **Miscellaneous Concrete Items** | **135,589** | **sf** | | **/sf** | |
| **32.13.00 Rigid Paving** | | | | | |
| ***Concrete pavement*** | | ***BP#2*** | | ***/BP#2*** | |
| ***Steps - premium*** | | ***BP#2*** | | ***/BP#2*** | |
| ***Dumpster pad*** | | ***BP#2*** | | ***/BP#2*** | |
| ***Concrete pavement with sawcut joints*** | | ***BP#2*** | | ***/BP#2*** | |
| **Rigid Paving** | **136,600** | **sf** | | **/sf** | |
| **03-30 CONCRETE** | **136,600** | **sf** | | **/sf** | |
| **03-45 POLISHED CONCRETE** | | | | | |
| **03.36.00 Miscellaneous Concrete Items** | | | | | |
| ***Polished concrete @ Auditorium - N/A*** | | *-* | | */-* | |
| **Miscellaneous Concrete Items** | **136,600** | **sf** | | **/sf** | |
| **03-45 POLISHED CONCRETE** | **136,600** | **sf** | | **/sf** | |
| **04-20 MASONRY (TS)** | | | | | |
| **01.43.00 Quality Assurance** | | | | | |
| Exterior wall mockup - Masonry, Allowance | 1 | allw | 7,500.00 | /allw | 7,500 |
| **Quality Assurance** | **136,600** | **sf** | **0.06** | **/sf** | **7,500** |
| **01.54.23 Temporary Scaffolding & Platforms** | | | | | |
| Temporary bracing of CMU @ Gym and Auditorium | 1 | ls | 100,000.00 | /ls | 100,000 |
| Exterior staging | 40,145 | sf | 2.50 | /sf | 100,363 |
| **Temporary Scaffolding & Platforms** | **136,600** | **sf** | **1.47** | **/sf** | **200,363** |
| **01.56.50 Winter Conditions** | | | | | |
| Masonry winter conditions/heat | 12 | wks | 5,000.00 | /wks | 60,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Winter Conditions** | **136,600 sf** | **0.44 /sf** | **60,000** |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Masonry) | (1) ls | 77,000.00 /ls | (77,000) |
| Trade support - lull, laborer for cleanup (Masonry) | 1 ls | 77,000.00 /ls | 77,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **03.45.00 Precast Architectural Concrete** | | | |
| ***Precast planters - N/A*** | - | */-* | |
| **Precast Architectural Concrete** | **136,600 sf** | **/sf** | |
| **04.05.23 Masonry Accessories** | | | |
| Install loose lintels (< 8") | 14 ea | 150.00 /ea | 2,100 |
| **Masonry Accessories** | **136,600 sf** | **0.02 /sf** | **2,100** |
| **04.21.13 Brick Masonry - Veneer** | | | |
| 4x4x12 iron spot brick veneer, scored | 6,105 sf | 36.00 /sf | 219,780 |
| 4x8x8 iron spot brick veneer, scored | 6,750 sf | 36.00 /sf | 243,000 |
| ***Brick veneer - interior - N/A*** | - | */-* | |
| Brick veneer, precast cap @ entry wall per A102A | 25 lf | 285.00 /lf | 7,125 |
| Sill brick/lip brick - Premium | 12,885 sf | 2.00 /sf | 25,770 |
| **Brick Masonry - Veneer** | **136,600 sf** | **3.63 /sf** | **495,675** |
| **04.22.00 Concrete Unit Masonry** | | | |
| 4x4x12 scored ground faced CMU veneer | 3,680 sf | 27.00 /sf | 99,360 |
| 4x8x16 scored ground faced CMU veneer | 23,615 sf | 29.00 /sf | 684,835 |
| Sill brick/lip brick - Premium | 27,295 sf | 2.00 /sf | 54,590 |
| CMU - 12" exterior wall | 15,795 sf | 25.00 /sf | 394,875 |
| CMU - 12" interior wall | 6,890 sf | 25.00 /sf | 172,250 |
| CMU - acoustical block, premium | 1,000 sf | 7.50 /sf | 7,500 |
| White CMU - Premium | 1 ls | 75,000.00 /ls | 75,000 |
| White CMU - Premium - VM E02 | (1) ls | 75,000.00 /ls | (75,000) |
| White CMU - Premium - VM E02 | 41,220 sf | 2.00 /sf | 82,440 |
| CMU - ground face block @ exterior, premium - VM E02 | (27,295) sf | 6.00 /sf | (163,770) |
| CMU - ground face block @ interior, premium | 1 ls | 35,000.00 /ls | 35,000 |
| CMU - ground face block @ interior, premium - VM E02 | (1) ls | 35,000.00 /ls | (35,000) |
| CMU - ground face block @ Auditorium, premium - VM E02 | 8,760 sf | 6.00 /sf | 52,560 |
| **Concrete Unit Masonry** | **136,600 sf** | **10.14 /sf** | **1,384,640** |
| **07.21.00 Thermal Insulation** | | | |
| Mineral wool insulation at brick/CMU veneer | 40,145 sf | 3.50 /sf | 140,508 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Thermal Insulation** | **136,600 sf** | **1.03 /sf** | **140,508** |
| **04-20 MASONRY (TS)** | **136,600 sf** | **16.77 /sf** | **2,290,785** |
| **05-12 STRUCTURAL STEEL** | | | |
| **01.43.00 Quality Assurance** | | | |
| ***Exterior wall mockup - Steel, Allowance*** | ***BP#2*** | ***/BP#2*** | |
| **Quality Assurance** | **136,600 sf** | **/sf** | |
| **05.05.23 Metal Fastenings** | | | |
| ***Moment connections @ floor*** | ***BP#2*** | ***/BP#2*** | |
| ***Moment connections @ roof*** | ***BP#2*** | ***/BP#2*** | |
| **Metal Fastenings** | **136,600 sf** | **/sf** | |
| **05.12.00 Structural Steel Framing** | | | |
| ***Steel @ floors*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel hangers - AESS*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel @ floors*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel @ screen wall - galvanized*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel @ Bandshell - AESS*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel @ Canopy - AESS*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel @ roof*** | ***BP#2*** | ***/BP#2*** | |
| ***Steel dunnage - RTU & chiller*** | ***BP#2*** | ***/BP#2*** | |
| ***Relieving angles @ brick veneer*** | ***BP#2*** | ***/BP#2*** | |
| ***Shoring @ Learning Commons*** | ***BP#2*** | ***/BP#2*** | |
| **Structural Steel Framing** | **136,600 sf** | **/sf** | |
| **05.20.00 Metal Joists** | | | |
| ***Open web joists, bridging*** | ***BP#2*** | ***/BP#2*** | |
| **Metal Joists** | **136,600 sf** | **/sf** | |
| **05.30.00 Metal Decking** | | | |
| ***Metal floor decking - galvanized (3" 18g)*** | ***BP#2*** | ***/BP#2*** | |
| ***Metal roof decking - acoustical (3" 18/16g)*** | ***BP#2*** | ***/BP#2*** | |
| ***Metal floor decking @ Breakout room LGMF floors*** | ***BP#2*** | ***/BP#2*** | |
| ***Metal roof decking - galvanized (1-1/2" 20g)*** | ***BP#2*** | ***/BP#2*** | |
| ***Metal roof decking - acoustical (1-1/2" 20g)*** | ***BP#2*** | ***/BP#2*** | |
| ***Metal roof decking - galvanized (3" 18g)*** | ***BP#2*** | ***/BP#2*** | |
| **Metal Decking** | **136,600 sf** | **/sf** | |
| **05.51.00 Metal Stairs** | | | |
| ***Ornamental stairs 4 and 5 - excluding rails*** | ***BP#2*** | ***/BP#2*** | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Metal Stairs** | **136,600 sf** | **/sf** | |
| **05.52.00 Metal Railings** | | | |
| ***Steel angles/stantions @ locker guardrail*** | ***BP#2*** | ***/BP#2*** | |
| **Metal Railings** | **136,600 sf** | **/sf** | |
| **05-12 STRUCTURAL STEEL** | **136,600 sf** | **/sf** | |
| **05-50 MISCELLANEOUS METALS (TS)** | | | |
| **05.50.00 Metal Fabrications** | | | |
| Misc. metal fabrications | 136,600 sf | 1.50 /sf | 204,900 |
| Seismic clips - 4' OC, each side | 270 ea | 60.00 /ea | 16,200 |
| Support for HVAC enclosure | 1 ls | 40,000.00 /ls | 40,000 |
| 1/4" steel plate @ tile | 1 ls | 15,000.00 /ls | 15,000 |
| Loose lintels - Furnish | 95 lf | 25.00 /lf | 2,375 |
| **Metal Fabrications** | **136,600 sf** | **2.04 /sf** | **278,475** |
| **05.51.00 Metal Stairs** | | | |
| Ornamental stairs 3 and 6 - excluding rails | 2 flt | 60,000.00 /flt | 120,000 |
| Egress stair | 5 flt | 30,000.00 /flt | 150,000 |
| Roof ladders | 3 ea | 1,500.00 /ea | 4,500 |
| Elevator pit ladders | 1 ea | 450.00 /ea | 450 |
| **Metal Stairs** | **136,600 sf** | **2.01 /sf** | **274,950** |
| **05.52.00 Metal Railings** | | | |
| Handrail @ steps/ramps | 55 lf | 295.00 /lf | 16,225 |
| Cane rails | 120 lf | 200.00 /lf | 24,000 |
| Guardrails @ Atrium | 380 lf | 500.00 /lf | 190,000 |
| Guardrails @ Atrium stairs | 235 lf | 500.00 /lf | 117,500 |
| Guardrails - 42" galvanized perforated @ exterior | 105 lf | 500.00 /lf | 52,500 |
| Guardrails - 42" galvanized perforated @ terrace | 30 lf | 500.00 /lf | 15,000 |
| Guardrails - exterior, colorgalv | 240 lf | 325.00 /lf | 78,000 |
| **Metal Railings** | **136,600 sf** | **3.61 /sf** | **493,225** |
| **05.70.00 Decorative Metal** | | | |
| Perforated architectural grille @ stage front | 120 sf | 200.00 /sf | 24,000 |
| Perforated architectural ceiling grille | 210 sf | 200.00 /sf | 42,000 |
| **Decorative Metal** | **136,600 sf** | **0.48 /sf** | **66,000** |
| **05-50 MISCELLANEOUS METALS (TS)** | **136,600 sf** | **8.15 /sf** | **1,112,650** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **06-25 FINISH CARPENTRY** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Finish Carpentry) | (1) ls | 72,000.00 /ls | (72,000) |
| Trade support - lull, laborer for cleanup (Finish Carpentry) | 1 ls | 72,000.00 /ls | 72,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **06.20.23 Interior Finish Carpentry** | | | |
| ***Wood base - N/A*** | - | */-* | |
| Miscellaneous wood base/trim | 136,600 sf | 0.50 /sf | 68,300 |
| Trim @ Breakout D glass lights | 320 sf | 25.00 /sf | 8,000 |
| Head and sill MDF trim per 1,2/A620 | 1,700 lf | 25.00 /lf | 42,500 |
| Window sills - P-lam | 1,100 lf | 25.00 /lf | 27,500 |
| Hardwood trim @ locker guardrail per A650 | 3,300 lf | 15.00 /lf | 49,500 |
| **Interior Finish Carpentry** | **136,600 sf** | **1.43 /sf** | **195,800** |
| **06.25.00 Prefinished Paneling** | | | |
| P-lam panel | 1,440 sf | 45.00 /sf | 64,800 |
| P-lam panel on Z-clips @ Breakout | 325 sf | 45.00 /sf | 14,625 |
| Suspended P-lam clouds @ Auditorium | 100 ea | 2,000.00 /ea | 200,000 |
| P-lam top panels @ locker guardrail per A650 | 1,025 lf | 50.00 /lf | 51,250 |
| P-lam side panels @ locker guardrail per A650 | 450 lf | 50.00 /lf | 22,500 |
| P-lam panel backsplash | 120 sf | 45.00 /sf | 5,400 |
| Marker tray - bamboo | 2,485 lf | 30.00 /lf | 74,550 |
| Casework for lockers (bank of 5) - including base | 1,025 lf | 250.00 /lf | 256,250 |
| MDF bumper rail | 3,715 lf | 25.00 /lf | 92,875 |
| P-lam wall panels - sound reflecting @ Auditorium | 2,925 sf | 45.00 /sf | 131,625 |
| P-lam wall panels - vestibules | 400 sf | 45.00 /sf | 18,000 |
| P-lam projector enclosure @ Auditorium | 1 ea | 2,500.00 /ea | 2,500 |
| **Prefinished Paneling** | **136,600 sf** | **6.84 /sf** | **934,375** |
| **06.41.00 Architectural Wood Casework** | | | |
| P-lam base cabinet w/top | 40 lf | 450.00 /lf | 18,000 |
| P-lam workstation w/top | 770 lf | 250.00 /lf | 192,500 |
| Mobile storage | 172 ea | 1,000.00 /ea | 172,000 |
| Mobile storage - VM I05 | (172) ea | 1,000.00 /ea | (172,000) |
| P-lam valance for fin tube | 570 lf | 45.00 /lf | 25,650 |
| P-lam 3/4" lip at counter for fin tube | 570 lf | 4.00 /lf | 2,280 |
| P-lam wall cabinet | 40 lf | 325.00 /lf | 13,000 |
| P-lam full height cabinet | 50 lf | 700.00 /lf | 35,000 |
| Bathroom vanity w/top | 210 lf | 250.00 /lf | 52,500 |
| Reception cabinet | 20 lf | 1,000.00 /lf | 20,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **06.41.00 Architectural Wood Casework** | | | |
| P-lam circulation desk | 10 lf | 750.00 /lf | 7,500 |
| P-lam work counter @ Admin | 10 lf | 1,500.00 /lf | 15,000 |
| ***P-lam counter @ Servery - In Food Service*** | - | /- | |
| P-lam end/filler panels @ Admin | 10 lf | 135.00 /lf | 1,350 |
| Mailboxes | 18 lf | 415.00 /lf | 7,470 |
| Storage shelving | 380 lf | 150.00 /lf | 57,000 |
| Storage shelving w/MDF | 470 lf | 200.00 /lf | 94,000 |
| P-lam bookcases | 40 lf | 500.00 /lf | 20,000 |
| Built-in benches | 205 lf | 600.00 /lf | 123,000 |
| Free-standing benches | 35 lf | 600.00 /lf | 21,000 |
| Display cases | 5 ea | 4,500.00 /ea | 22,500 |
| ***Misc. casework - N/A*** | - | /- | |
| Phenolic bench per A102A | 1 ea | 4,200.00 /ea | 4,200 |
| Wood louvered shades - Rulon panel grille | 450 lf | 150.00 /lf | 67,500 |
| **Architectural Wood Casework** | **136,600 sf** | **5.85 /sf** | **799,450** |
| **06-25 FINISH CARPENTRY** | **136,600 sf** | **14.13 /sf** | **1,929,625** |
| **07-10 WATERPROOFING & JOINT SEALANTS (TS)** | | | |
| **01.43.00 Quality Assurance** | | | |
| Exterior wall mockup - Waterproofing, Allowance | 1 allw | 5,000.00 /allw | 5,000 |
| **Quality Assurance** | **136,600 sf** | **0.04 /sf** | **5,000** |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Waterproofing) | (1) ls | 29,000.00 /ls | (29,000) |
| Trade support - lull, laborer for cleanup (Waterproofing) | 1 ls | 29,000.00 /ls | 29,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **07.10.00 Dampproofing & Waterproofing** | | | |
| Caulking @ storefront/curtainwall | 7,425 lf | 4.00 /lf | 29,700 |
| Caulking & sealants @ interior | 136,600 sf | 0.90 /sf | 122,940 |
| ***Dampproofing at foundation wall*** | ***BP#2*** | ***/BP#2*** | |
| Misc. caulking & sealants @ exterior | 73,210 sf | 0.75 /sf | 54,908 |
| ***Foundation wall waterproofing - membrane w/ drainage board*** | ***BP#2*** | ***/BP#2*** | |
| ***Elevator pit waterproofing - cementitious*** | ***BP#2*** | ***/BP#2*** | |
| **Dampproofing & Waterproofing** | **136,600 sf** | **1.52 /sf** | **207,548** |
| **07.26.00 Vapor Retarders** | | | |
| Air and vapor barrier @ exterior walls | 56,650 sf | 7.50 /sf | 424,875 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **07.26.00 Vapor Retarders** | | | |
| Air and vapor barrier @ soffits | 1,245 sf | 7.50 /sf | 9,338 |
| Air and vapor barrier @ phenolic fins per A102A, A315 | 380 sf | 7.50 /sf | 2,850 |
| Window transitions | 7,425 lf | 10.00 /lf | 74,250 |
| **Vapor Retarders** | **136,600 sf** | **3.74 /sf** | **511,313** |
| **07-10 WATERPROOFING & JOINT SEALANTS (TS)** | **136,600 sf** | **5.30 /sf** | **723,860** |
| **07-42 METAL/COMPOSITE PANELS & SIDING** | | | |
| **01.43.00 Quality Assurance** | | | |
| Exterior wall mockup - Siding, Allowance | 1 allw | 10,000.00 /allw | 10,000 |
| **Quality Assurance** | **136,600 sf** | **0.07 /sf** | **10,000** |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Siding) | (1) ls | 48,000.00 /ls | (48,000) |
| Trade support - lull, laborer for cleanup (Siding) | 1 ls | 48,000.00 /ls | 48,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **07.42.00 Wall Panels** | | | |
| Corrugated, perforated metal siding @ screen walls | 1,105 sf | 45.00 /sf | 49,725 |
| Exposed fastener metal panel | 6,065 sf | 48.00 /sf | 291,120 |
| Composite metal panel siding | 3,120 sf | 75.00 /sf | 234,000 |
| Phenolic panel siding | 7,705 sf | 80.00 /sf | 616,400 |
| **Wall Panels** | **136,600 sf** | **8.72 /sf** | **1,191,245** |
| **07-42 METAL/COMPOSITE PANELS & SIDING** | **136,600 sf** | **8.79 /sf** | **1,201,245** |
| **07-50 MEMBRANE ROOFING (TS)** | | | |
| **01.43.00 Quality Assurance** | | | |
| Exterior wall mockup - Roofing, Allowance | 1 allw | 2,500.00 /allw | 2,500 |
| **Quality Assurance** | **136,600 sf** | **0.02 /sf** | **2,500** |
| **07.50.00 Membrane Roofing** | | | |
| PVC membrane roof w/insulation, underlayment, cover board, vapor barrier | 63,155 sf | 19.00 /sf | 1,199,945 |
| Addional layer of protection board | 7,565 sf | 3.00 /sf | 22,695 |
| PVC membrane @ walls | 2,740 sf | 20.25 /sf | 55,485 |
| Reinforced walkway pads | 715 sf | 7.50 /sf | 5,363 |
| Pavers - terrace | 295 sf | 35.00 /sf | 10,325 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **07.50.00 Membrane Roofing** | | | |
| Pavers - main entrance | 780 sf | 35.00 /sf | 27,300 |
| **Membrane Roofing** | **136,600 sf** | **9.67 /sf** | **1,321,113** |
| **07.72.00 Roof Accessories** | | | |
| Roof accessories | 63,155 sf | 0.35 /sf | 22,104 |
| Roof vents & hatches | 1 ls | 25,000.00 /ls | 25,000 |
| Metal roof facia | 2,695 lf | 35.00 /lf | 94,325 |
| Additional flashing, scuppers | 63,155 sf | 0.75 /sf | 47,366 |
| **Roof Accessories** | **136,600 sf** | **1.38 /sf** | **188,796** |
| **07-50 MEMBRANE ROOFING (TS)** | **136,600 sf** | **11.07 /sf** | **1,512,408** |
| **07-81 FIREPROOFING** | | | |
| **07.81.00 Applied Fireproofing** | | | |
| Sprayed fireproofing - steel beams and columns @ floor structure | 64,740 sf | 3.00 /sf | 194,220 |
| Sprayed fireproofing - steel beams and columns @ roof structure below 20' | 33,575 sf | 3.00 /sf | 100,725 |
| Patch Sprayed fireproofing - floor structure | 5 days | 3,500.00 /days | 17,500 |
| Patch Sprayed fireproofing - roof structure | 5 days | 3,500.00 /days | 17,500 |
| Intumescent fireproofing @ Learning Commons | 1 ls | 72,000.00 /ls | 72,000 |
| **Applied Fireproofing** | **136,600 sf** | **2.94 /sf** | **401,945** |
| **07-81 FIREPROOFING** | **136,600 sf** | **2.94 /sf** | **401,945** |
| **08-10 DOORS, FRAMES & HARDWARE** | | | |
| **08.10.05 Doors & Frames** | | | |
| Install exterior door, HW | 14 ea | 300.00 /ea | 4,200 |
| Install interior door, HW | 300 ea | 300.00 /ea | 90,000 |
| **Doors & Frames** | **136,600 sf** | **0.69 /sf** | **94,200** |
| **08.11.13 Hollow Metal Doors & Frames** | | | |
| HM doors - interior - flush | 45 lvs | 310.00 /lvs | 13,950 |
| HM doors - exterior flush | 23 lvs | 625.00 /lvs | 14,375 |
| HM frames - exterior single | 5 ea | 255.00 /ea | 1,275 |
| HM frames - exterior double | 9 ea | 440.00 /ea | 3,960 |
| HM frames - interior single | 258 ea | 310.00 /ea | 79,980 |
| HM frames - interior single, tandem | 13 ea | 360.00 /ea | 4,680 |
| HM frames - interior double | 29 ea | 385.00 /ea | 11,165 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Hollow Metal Doors & Frames** | **136,600 sf** | **0.95 /sf** | **129,385** |
| **08.14.00 Wood Doors** | | | |
| Wood door - interior flush | 297 lvs | 390.00 /lvs | 115,830 |
| Fire rated wood doors - premium | 44 lvs | 390.00 /lvs | 17,160 |
| Acoustical doors (STC 45) - premium | 1 ls | 15,000.00 /ls | 15,000 |
| **Wood Doors** | **136,600 sf** | **1.08 /sf** | **147,990** |
| **08.71.00 Door Hardware** | | | |
| Hardware sets - exterior door/panic | 14 set | 1,920.01 /set | 26,880 |
| Hardware sets - auto operators | 1 set | 4,500.00 /set | 4,500 |
| Hardware sets - standard interior | 287 set | 1,015.00 /set | 291,305 |
| Hardware sets - interior, tandem | 13 set | 1,330.00 /set | 17,290 |
| **Door Hardware** | **136,600 sf** | **2.49 /sf** | **339,975** |
| **08-10 DOORS, FRAMES & HARDWARE** | **136,600 sf** | **5.21 /sf** | **711,550** |
| **08-34 OVERHEAD DOORS & GRILLES** | | | |
| **08.33.00 Coiling Doors & Grilles** | | | |
| Coiling security screen - 4' high, manual | 85 sf | 70.00 /sf | 5,950 |
| Coiling security screen - 8' high, manual | 690 sf | 70.00 /sf | 48,300 |
| Custom security gate @ Learning Commons | 2 lvs | 6,000.00 /lvs | 12,000 |
| **Coiling Doors & Grilles** | **136,600 sf** | **0.49 /sf** | **66,250** |
| **08.36.00 Panel Doors** | | | |
| Overhead coiling door | 1 ea | 7,500.00 /ea | 7,500 |
| **Panel Doors** | **136,600 sf** | **0.06 /sf** | **7,500** |
| **11.13.00 Loading Dock Equipment** | | | |
| Loading dock equipment | 1 ls | 1,000.00 /ls | 1,000 |
| **Loading Dock Equipment** | **136,600 sf** | **0.01 /sf** | **1,000** |
| **08-34 OVERHEAD DOORS & GRILLES** | **136,600 sf** | **0.55 /sf** | **74,750** |
| **08-41 ALUMINUM STOREFRONT & WINDOWS (TS)** | | | |
| **01.43.00 Quality Assurance** | | | |
| Exterior wall mockup - Windows, Allowance | 1 allw | 20,000.00 /allw | 20,000 |
| **Quality Assurance** | **136,600 sf** | **0.15 /sf** | **20,000** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Windows) | (1) ls | 73,000.00 /ls | (73,000) |
| Trade support - lull, laborer for cleanup (Windows) | 1 ls | 73,000.00 /ls | 73,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **08.41.00 Entrances & Storefronts** | | | |
| Aluminum storefront/windows | 11,555 sf | 100.00 /sf | 1,155,500 |
| Aluminum storefront - interior, School Guard | 340 sf | 140.00 /sf | 47,600 |
| Aluminum windows - interior, School Guard | 2 ea | 12,000.00 /ea | 24,000 |
| Aluminum storefront - School Guard | 545 sf | 140.00 /sf | 76,300 |
| Extruded aluminum perimeter angles | 7,425 lf | 30.00 /lf | 222,750 |
| Aluminum entrance doors, HW - exterior | 4 lvs | 6,000.00 /lvs | 24,000 |
| Aluminum entrance doors, HW - interior | 1 lvs | 6,000.00 /lvs | 6,000 |
| Aluminum entrance doors, HW - interior, School Guard | 8 lvs | 7,000.00 /lvs | 56,000 |
| Aluminum entrance doors, HW - exterior, School Guard | 11 lvs | 7,000.00 /lvs | 77,000 |
| **Entrances & Storefronts** | **136,600 sf** | **12.37 /sf** | **1,689,150** |
| **08.63.00 Metal-Framed Skylights** | | | |
| Metal-framed skylights (8:12) | 4,130 sf | 150.00 /sf | 619,500 |
| Metal-framed skylights gable ends | 490 sf | 150.00 /sf | 73,500 |
| **Metal-Framed Skylights** | **136,600 sf** | **5.07 /sf** | **693,000** |
| **08.71.00 Door Hardware** | | | |
| Automatic operators | 3 pair | 4,400.00 /pair | 13,200 |
| **Door Hardware** | **136,600 sf** | **0.10 /sf** | **13,200** |
| **08-41 ALUMINUM STOREFRONT & WINDOWS (TS)** | **136,600 sf** | **17.68 /sf** | **2,415,350** |
| **08-45 TRANSLUCENT PANEL SYSTEMS** | | | |
| **08.45.00 Translucent Wall & Roof Assemblies** | | | |
| Polycarbonate glazing @ canopy | 440 sf | 150.00 /sf | 66,000 |
| Polycarbonate glazing @ canopy - VM E01 | (440) sf | 150.00 /sf | (66,000) |
| **Translucent Wall & Roof Assemblies** | **136,600 sf** | **/sf** | |
| **08-45 TRANSLUCENT PANEL SYSTEMS** | **136,600 sf** | **/sf** | |
| **08-80 GLASS & GLAZING (TS)** | | | |
| **08.80.00 Glazing** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **08.80.00 Glazing** | | | |
| Misc. interior glass & glazing | 136,600 sf | 0.25 /sf | 34,150 |
| Glazed partition | 4,700 sf | 60.00 /sf | 282,000 |
| Glazed partition - double acoustic | 625 sf | 110.00 /sf | 68,750 |
| Glazed partition @ sidelights | 1,165 sf | 75.00 /sf | 87,375 |
| Glass walls @ Breakout | 2,323 sf | 100.00 /sf | 232,300 |
| ***Glass roof @ Breakout - N/A*** | - | /- | |
| Glass roof @ canopy - VM E01 | 82 sf | 150.00 /sf | 12,300 |
| Door glazing - full | 159 ea | 400.00 /ea | 63,600 |
| Door glazing - narrow | 2 ea | 100.00 /ea | 200 |
| Mirrors - unframed restroom | 1,145 sf | 35.00 /sf | 40,075 |
| Glass @ Bandshell (vertical) - 9/16" tempered, laminated | 235 sf | 150.00 /sf | 35,250 |
| Glass @ Bandshell (roof) - 9/16" tempered, laminated | 300 sf | 150.00 /sf | 45,000 |
| **Glazing** | **136,600 sf** | **6.60 /sf** | **901,000** |
| **08.88.00 Glazing Surface Films** | | | |
| Graduated glass film | 3,675 sf | 5.00 /sf | 18,375 |
| 3M Safety and Security Window Film @ glass walls | 4,090 sf | 15.00 /sf | 61,350 |
| 3M Safety and Security Window Film @ doors | 67 lvs | 450.00 /lvs | 30,150 |
| **Glazing Surface Films** | **136,600 sf** | **0.80 /sf** | **109,875** |
| **08-80 GLASS & GLAZING (TS)** | **136,600 sf** | **7.40 /sf** | **1,010,875** |
| **08-90 LOUVERS** | | | |
| **08.90.00 Louvers & Vents** | | | |
| Metal louver | 625 sf | 85.00 /sf | 53,125 |
| **Louvers & Vents** | **136,600 sf** | **0.39 /sf** | **53,125** |
| **08-90 LOUVERS** | **136,600 sf** | **0.39 /sf** | **53,125** |
| **09-21 DRYWALL** | | | |
| **01.43.00 Quality Assurance** | | | |
| Exterior wall mockup - Drywall, Allowance | 1 allw | 10,000.00 /allw | 10,000 |
| **Quality Assurance** | **136,600 sf** | **0.07 /sf** | **10,000** |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Drywall) | (1) ls | 188,000.00 /ls | (188,000) |
| Trade support - lull, laborer for cleanup (Drywall) | 1 ls | 188,000.00 /ls | 188,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **05.40.00 Cold-Formed Metal Framing** | | | |
| Light gage metal framing @ Breakout floors | 1,440 sf | 60.00 /sf | 86,400 |
| Light gage metal framing @ Breakout walls | 16,820 sf | 25.00 /sf | 420,500 |
| **Cold-Formed Metal Framing** | **136,600 sf** | **3.71 /sf** | **506,900** |
| **06.10.00 Rough Carpentry** | | | |
| Roof blocking | 5,390 lf | 32.00 /lf | 172,480 |
| Window blocking | 7,425 lf | 12.75 /lf | 94,669 |
| Door blocking - exterior | 265 lf | 13.85 /lf | 3,671 |
| Door blocking - interior | 4,965 lf | 13.85 /lf | 68,772 |
| In-wall blocking | 12,160 lf | 12.75 /lf | 155,040 |
| Miscellaneous rough carpentry - Allowance | 136,600 sf | 0.50 /sf | 68,300 |
| **Rough Carpentry** | **136,600 sf** | **4.12 /sf** | **562,932** |
| **07.84.00 Firestopping** | | | |
| Firestopping @ rated walls | 5,630 lf | 16.20 /lf | 91,206 |
| Miscellaneous firestopping | 136,600 sf | 0.10 /sf | 13,660 |
| **Firestopping** | **136,600 sf** | **0.77 /sf** | **104,866** |
| **08.31.00 Access Doors & Panels** | | | |
| Access panels | 1 ls | 15,000.00 /ls | 15,000 |
| **Access Doors & Panels** | **136,600 sf** | **0.11 /sf** | **15,000** |
| **09.21.13 Gypsum Board Assemblies - Walls** | | | |
| Level 5 finish - Allowance | 25,000 sf | 2.55 /sf | 63,750 |
| Interior wall framing - 2-1/2" | 3,370 sf | 5.75 /sf | 19,378 |
| Interior wall framing - 3-5/8"/4" | 96,355 sf | 5.75 /sf | 554,041 |
| Interior wall framing - 6" | 7,050 sf | 7.65 /sf | 53,933 |
| Interior wall framing - 8" | 21,965 sf | 10.15 /sf | 222,945 |
| Interior wall framing - 10" | 555 sf | 12.10 /sf | 6,716 |
| GWB - 5/8", level 4 | 229,230 sf | 4.15 /sf | 951,305 |
| GWB - 5/8", additional layer | 96,320 sf | 3.50 /sf | 336,627 |
| GWB - high impact | 1 ls | 50,000.00 /ls | 50,000 |
| Shaft liner - 1" | 2,420 sf | 4.15 /sf | 10,043 |
| Sound batt insulation | 137,275 sf | 1.60 /sf | 219,640 |
| Half height walls @ Auditorium | 400 sf | 22.90 /sf | 9,160 |
| LGMF framing @ locker guardrail | 4,095 sf | 5.10 /sf | 20,885 |
| GWB - 5/8", level 5 @ locker guardrail | 4,095 sf | 6.70 /sf | 27,437 |
| Curved walls - premium | 5,205 sf | 6.35 /sf | 33,074 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **09.21.13 Gypsum Board Assemblies - Walls** | | | |
| Exterior walls - 10" studs, 1/2" sheathing, 5/8" GWB, insulation | 44,220 sf | 23.50 /sf | 1,039,170 |
| Framing @ phenolic fins per A102A, A315 | 380 sf | 7.65 /sf | 2,907 |
| Install HM door frames - exterior single | 5 ea | 73.00 /ea | 365 |
| Install HM door frames - interior single | 271 ea | 73.00 /ea | 19,783 |
| Install HM door frames - exterior double | 9 ea | 117.00 /ea | 1,053 |
| Install HM door frames - interior double | 29 ea | 117.00 /ea | 3,393 |
| **Gypsum Board Assemblies - Walls** | **136,600 sf** | **26.69 /sf** | **3,645,602** |
| **09.21.16 Gypsum Board Assemblies - Ceilings & Soffits** | | | |
| Gypsum board ceilings | 21,010 sf | 15.25 /sf | 320,411 |
| Gypsum board ceilings - 1 hr | 655 sf | 19.10 /sf | 12,511 |
| Gypsum board ceilings - 2 hr | 80 sf | 22.90 /sf | 1,832 |
| Gypsum board ceilings - resilient | 5,350 sf | 31.75 /sf | 169,863 |
| Stucco soffit | 1,245 sf | 11.35 /sf | 14,131 |
| Exterior soffit framing, sheathing, insulation | 1,245 sf | 23.90 /sf | 29,756 |
| Gypsum board soffits | 28,335 sf | 25.45 /sf | 721,126 |
| Gypsum board soffits - VM I11 | (2,250) sf | 25.45 /sf | (57,263) |
| Gypsum board soffits @ Learning Commons | 4,920 sf | 25.45 /sf | 125,214 |
| Gypsum board soffits @ Skylights | 1,915 sf | 25.45 /sf | 48,737 |
| **Gypsum Board Assemblies - Ceilings & Soffits** | **136,600 sf** | **10.15 /sf** | **1,386,316** |
| **09.21.25 Gypsum Board Assemblies - Patching/Infills** | | | |
| Patch GWB | 136,600 sf | 0.35 /sf | 47,810 |
| **Gypsum Board Assemblies - Patching/Infills** | **136,600 sf** | **0.35 /sf** | **47,810** |
| **09.77.33 Fiberglass Reinforced Panels** | | | |
| Fiberglass reinforced panels (FRP) - wall panels | 2,240 sf | 8.00 /sf | 17,920 |
| **Fiberglass Reinforced Panels** | **136,600 sf** | **0.13 /sf** | **17,920** |
| **09-21 DRYWALL** | **136,600 sf** | **46.10 /sf** | **6,297,346** |
| **09-30 TILE (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Tile) | (1) ls | 7,000.00 /ls | (7,000) |
| Trade support - lull, laborer for cleanup (Tile) | 1 ls | 7,000.00 /ls | 7,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **09.30.00 Tiling** | | | |
| Ceramic wall tile | 2,295 sf | 18.00 /sf | 41,310 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **09.30.00 Tiling** | | | |
| Porcelain floor tile | 5,475 sf | 25.00 /sf | 136,875 |
| Quarry floor tile | 1,770 sf | 20.00 /sf | 35,400 |
| Quarry tile base | 280 lf | 20.00 /lf | 5,600 |
| **Tiling** | **136,600 sf** | **1.61 /sf** | **219,185** |
| **09-30 TILE (TS)** | **136,600 sf** | **1.61 /sf** | **219,185** |
| **09-51 ACOUSTICAL CEILINGS (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Ceilings) | (1) ls | 49,000.00 /ls | (49,000) |
| Trade support - lull, laborer for cleanup (Ceilings) | 1 ls | 49,000.00 /ls | 49,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **09.51.00 Acoustical Ceilings** | | | |
| A1 - Armstrong Ultima #1911, random running bond pattern | 21,400 sf | 9.00 /sf | 192,600 |
| A1 - Armstrong Ultima #1911 @ Learning Commons corridors | 9,980 sf | 9.00 /sf | 89,820 |
| A2 - Armstrong Calla #2824 | 20,985 sf | 8.00 /sf | 167,880 |
| A2 - Armstrong Calla #2824 - VM I03 | 1,393 sf | 8.00 /sf | 11,144 |
| A3 - USG Geometrix 3 Dimensional | 3,815 sf | 35.00 /sf | 133,525 |
| A3 - USG Geometrix 3 Dimensional - VM I03 | (1,393) sf | 35.00 /sf | (48,755) |
| A4 - Armstrong Healthzone Ultima | 1,760 sf | 7.00 /sf | 12,320 |
| **Acoustical Ceilings** | **136,600 sf** | **4.09 /sf** | **558,534** |
| **09.80.00 Acoustical Treatment** | | | |
| Fabric wrapped acoustical panels | 12,275 sf | 20.00 /sf | 245,500 |
| Tectum wall panels | 5,535 sf | 18.00 /sf | 99,630 |
| ***Mural panorama wall covering - By Others*** | - | /- | |
| **Acoustical Treatment** | **136,600 sf** | **2.53 /sf** | **345,130** |
| **09-51 ACOUSTICAL CEILINGS (TS)** | **136,600 sf** | **6.62 /sf** | **903,664** |
| **09-64 WOOD FLOORING** | | | |
| **09.64.00 Wood Flooring** | | | |
| Hardwood stage assembly | 1,610 sf | 25.00 /sf | 40,250 |
| Wood athletic flooring | 8,570 sf | 20.00 /sf | 171,400 |
| **Wood Flooring** | **136,600 sf** | **1.55 /sf** | **211,650** |
| **09-64 WOOD FLOORING** | **136,600 sf** | **1.55 /sf** | **211,650** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **09-65 RESILIENT FLOORING (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Resilient) | (1) ls | 48,000.00 /ls | (48,000) |
| Trade support - lull, laborer for cleanup (Resilient) | 1 ls | 48,000.00 /ls | 48,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **09.61.00 Flooring Treatment** | | | |
| Underlayment at 2nd and 3rd floor linoleum - Forbo NR99, exclude corridors | 36,505 sf | 4.00 /sf | 146,020 |
| ***Moisture mitigation - Excluded*** | - | */-* | |
| **Flooring Treatment** | **136,600 sf** | **1.07 /sf** | **146,020** |
| **09.65.00 Resilient Flooring** | | | |
| Linoleum tile | 90,135 sf | 6.00 /sf | 540,810 |
| Linoleum tile base w/trim | 19,260 lf | 9.00 /lf | 173,340 |
| Linoleum tile base w/trim - VM I10 | (15,545) lf | 9.00 /lf | (139,905) |
| Linoleum tile base - VM I10 | 15,545 lf | 7.00 /lf | 108,815 |
| Rubber base | 2,175 lf | 3.50 /lf | 7,613 |
| Vented base @ Gym | 370 lf | 8.00 /lf | 2,960 |
| Rubber flooring @ ornamental stairs | 770 sf | 8.00 /sf | 6,160 |
| **Resilient Flooring** | **136,600 sf** | **5.12 /sf** | **699,793** |
| **09-65 RESILIENT FLOORING (TS)** | **136,600 sf** | **6.19 /sf** | **845,813** |
| **09-67 RESINOUS FLOORING** | | | |
| **09.67.00 Fluid-Applied Flooring** | | | |
| Epoxy flooring/base | 5,780 sf | 14.00 /sf | 80,920 |
| **Fluid-Applied Flooring** | **136,600 sf** | **0.59 /sf** | **80,920** |
| **09-67 RESINOUS FLOORING** | **136,600 sf** | **0.59 /sf** | **80,920** |
| **09-68 CARPET** | | | |
| **09.68.00 Carpeting** | | | |
| Carpet @ Auditorium | 135 sy | 45.00 /sy | 6,075 |
| **Carpeting** | **136,600 sf** | **0.04 /sf** | **6,075** |
| **12.48.13 Entrance Floor Mats & Frames** | | | |
| Entry mats - recessed | 435 sf | 40.00 /sf | 17,400 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Entrance Floor Mats & Frames** | **136,600 sf** | **0.13 /sf** | **17,400** |
| **09-68 CARPET** | **136,600 sf** | **0.17 /sf** | **23,475** |
| **09-90 PAINTING (TS)** | | | |
| **09.90.00 Painting & Coating** | | | |
| Paint GWB partitions | 227,710 sf | 0.80 /sf | 182,168 |
| ***Paint CMU - N/A*** | - | /- | |
| Epoxy wall paint | 15,550 sf | 2.30 /sf | 35,765 |
| Prep/paint Bandshell | 1 ls | 10,000.00 /ls | 10,000 |
| Prep/paint main and West Admin egress canopies | 1 ls | 10,000.00 /ls | 10,000 |
| Paint GWB ceilings | 21,735 sf | 1.00 /sf | 21,735 |
| Paint GWB soffits | 35,170 sf | 1.00 /sf | 35,170 |
| Paint HM doors - exerior | 23 lvs | 90.00 /lvs | 2,070 |
| Paint HM doors - interior | 45 lvs | 90.00 /lvs | 4,050 |
| Paint HM frames - exterior, single | 5 ea | 50.00 /ea | 250 |
| Paint HM frames - interior, single | 271 ea | 50.00 /ea | 13,550 |
| Paint HM frames - exterior, double | 9 ea | 60.00 /ea | 540 |
| Paint HM frames - interior, double | 29 ea | 60.00 /ea | 1,740 |
| Paint egress stairs | 5 flt | 2,000.00 /flt | 10,000 |
| Paint exposed ceilings | 24,085 sf | 1.50 /sf | 36,128 |
| Paint exposed ceilings @ Gym and Auditorium | 14,385 sf | 2.50 /sf | 35,963 |
| Seal concrete floor | 7,245 sf | 2.00 /sf | 14,490 |
| Seal concrete floor @ Auditorium | 3,650 sf | 2.00 /sf | 7,300 |
| Misc. exterior painting | 73,210 sf | 0.50 /sf | 36,605 |
| Touchup | 136,600 sf | 0.50 /sf | 68,300 |
| **Painting & Coating** | **136,600 sf** | **3.85 /sf** | **525,823** |
| **09-90 PAINTING (TS)** | **136,600 sf** | **3.85 /sf** | **525,823** |
| **10-14 SIGNAGE** | | | |
| **10.14.00 Signage** | | | |
| Interior signage | 136,600 sf | 0.35 /sf | 47,810 |
| Exterior signage | 1 ls | 25,000.00 /ls | 25,000 |
| **Signage** | **136,600 sf** | **0.53 /sf** | **72,810** |
| **10-14 SIGNAGE** | **136,600 sf** | **0.53 /sf** | **72,810** |
| **10-24 OPERABLE PARTITIONS** | | | |
| **10.22.00 Partitions** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **10.22.00 Partitions** | | | |
| Operable partitions w/writeable surface on one side | 325 sf | 77.00 /sf | 25,025 |
| Operable partitions w/writeable surface on both sides | 2,740 sf | 98.00 /sf | 268,520 |
| **Partitions** | **136,600 sf** | **2.15 /sf** | **293,545** |
| **10-24 OPERABLE PARTITIONS** | **136,600 sf** | **2.15 /sf** | **293,545** |
| **10-51 LOCKERS** | | | |
| **10.51.00 Lockers** | | | |
| Student lockers - phenolic | 660 ea | 580.00 /ea | 382,800 |
| Athletic lockers | 80 ea | 350.00 /ea | 28,000 |
| Staff lockers | 12 ea | 400.00 /ea | 4,800 |
| Locker benches | 12 lf | 55.00 /lf | 660 |
| **Lockers** | **136,600 sf** | **3.05 /sf** | **416,260** |
| **10-51 LOCKERS** | **136,600 sf** | **3.05 /sf** | **416,260** |
| **10-95 MISCELLANEOUS SPECIALTIES** | | | |
| **10.11.00 Visual Display Units** | | | |
| Magnetic writeable wall covering | 9,045 sf | 22.00 /sf | 198,990 |
| **Visual Display Units** | **136,600 sf** | **1.46 /sf** | **198,990** |
| **10.21.00 Compartments & Cubicles** | | | |
| Toilet partition | 23 ea | 1,020.00 /ea | 23,460 |
| Toilet partition - handicap | 16 ea | 1,650.00 /ea | 26,400 |
| Urinal screens - wall-hung | 15 ea | 433.00 /ea | 6,495 |
| Cubicle curtains | 45 lf | 40.00 /lf | 1,800 |
| Cubicle curtain track | 45 lf | 11.50 /lf | 518 |
| **Compartments & Cubicles** | **136,600 sf** | **0.43 /sf** | **58,673** |
| **10.26.00 Wall & Door Protection** | | | |
| Corner guards | 1 ls | 20,000.00 /ls | 20,000 |
| **Wall & Door Protection** | **136,600 sf** | **0.15 /sf** | **20,000** |
| **10.28.00 Toilet, Bath, & Laundry Accessories** | | | |
| Toilet paper dispenser | 54 ea | 105.17 /ea | 5,679 |
| Grab bar | 62 ea | 141.38 /ea | 8,765 |
| Soap dispenser - surface mounted | 59 ea | 87.64 /ea | 5,171 |
| Paper towel dispenser - recessed | 32 ea | 136.79 /ea | 4,377 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **10.28.00 Toilet, Bath, & Laundry Accessories** | | | |
| Framed mirrors | 15 ea | 171.00 /ea | 2,565 |
| Sanitary napkin disposal | 46 ea | 274.00 /ea | 12,604 |
| Shower curtains, hooks & rod | 3 ea | 125.00 /ea | 375 |
| Shower seat | 2 ea | 668.00 /ea | 1,336 |
| Mop rack | 3 ea | 230.67 /ea | 692 |
| **Toilet, Bath, & Laundry Accessories** | **136,600 sf** | **0.30 /sf** | **41,564** |
| **10.40.00 Safety Specialties** | | | |
| Fire extinguisher cabinet - fully recessed | 27 ea | 350.00 /ea | 9,450 |
| **Safety Specialties** | **136,600 sf** | **0.07 /sf** | **9,450** |
| **10.80.00 Other Specialties** | | | |
| Misc. specialties - Allowance | 136,600 sf | 0.25 /sf | 34,150 |
| **Other Specialties** | **136,600 sf** | **0.25 /sf** | **34,150** |
| **11.52.00 Audio-Visual Equipment** | | | |
| Projection screen @ Gym, Cafeteria | 2 ea | 10,000.00 /ea | 20,000 |
| Projection screen | 1 ea | 5,000.00 /ea | 5,000 |
| **Audio-Visual Equipment** | **136,600 sf** | **0.18 /sf** | **25,000** |
| **10-95 MISCELLANEOUS SPECIALTIES** | **136,600 sf** | **2.84 /sf** | **387,827** |
| **11-31 RESIDENTIAL APPLIANCES** | | | |
| **11.31.00 Residential Appliances** | | | |
| Refrigerator | 7 ea | 1,200.00 /ea | 8,400 |
| ***Ice maker - None shown*** | - | /- | |
| ***Undercounter refrigerator - None shown*** | - | /- | |
| Microwave oven | 1 ea | 450.00 /ea | 450 |
| Range hood | 1 ea | 650.00 /ea | 650 |
| Range | 1 ea | 900.00 /ea | 900 |
| Dishwasher | 4 ea | 925.00 /ea | 3,700 |
| Washer/dryer - stackable | 2 ea | 1,500.00 /ea | 3,000 |
| **Residential Appliances** | **136,600 sf** | **0.13 /sf** | **17,100** |
| **11-31 RESIDENTIAL APPLIANCES** | **136,600 sf** | **0.13 /sf** | **17,100** |
| **11-40 FOOD SERVICE EQUIPMENT** | | | |
| **11.40.00 Foodservice Equipment** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **11.40.00 Foodservice Equipment** | | | |
| Food service equipment - Allowance | 1 ls | 415,270.00 /ls | 415,270 |
| **Foodservice Equipment** | **136,600 sf** | **3.04 /sf** | **415,270** |
| **11-40 FOOD SERVICE EQUIPMENT** | **136,600 sf** | **3.04 /sf** | **415,270** |
| **11-51 AUDIO-VISUAL EQUIPMENT** | | | |
| **11.52.00 Audio-Visual Equipment** | | | |
| Sound systems @ Auditorium - Allowance | 1 allw | 200,000.00 /allw | 200,000 |
| Sound systems @ Gym - Allowance | 1 allw | 120,000.00 /allw | 120,000 |
| Sound systems @ Cafeteria - Allowance | 1 allw | 50,000.00 /allw | 50,000 |
| Sound systems @ Band/Chorus - Allowance | 2 allw | 30,000.00 /allw | 60,000 |
| Sound systems @ Drama - Allowance | 1 allw | 20,000.00 /allw | 20,000 |
| **Audio-Visual Equipment** | **136,600 sf** | **3.29 /sf** | **450,000** |
| **11-51 AUDIO-VISUAL EQUIPMENT** | **136,600 sf** | **3.29 /sf** | **450,000** |
| **11-61 THEATER & STAGE EQUIPMENT** | | | |
| **11.61.00 Theater & Stage Equipment** | | | |
| ***Orchestra enclosures - FFE*** | - | /- | |
| Theatrical rigging - Allowance | 1 ls | 158,300.00 /ls | 158,300 |
| Theatrical draperies - Allowance | 1 ls | 33,854.00 /ls | 33,854 |
| Theatrical lighting instruments & accessories - Allowance | 1 ls | 129,018.00 /ls | 129,018 |
| Theatrical lighting controls - Allowance | 1 ls | 95,749.00 /ls | 95,749 |
| **Theater & Stage Equipment** | **136,600 sf** | **3.05 /sf** | **416,921** |
| **11-61 THEATER & STAGE EQUIPMENT** | **136,600 sf** | **3.05 /sf** | **416,921** |
| **11-65 ATHLETIC/RECREATIONAL EQUIPMENT** | | | |
| **11.65.00 Athletic & Recreational Equipment** | | | |
| Basketball backstop - ceiling-hung | 6 ea | 6,500.00 /ea | 39,000 |
| Gym divider curtain - electric roll up | 1,530 sf | 20.00 /sf | 30,600 |
| Athletic wall padding | 835 sf | 12.50 /sf | 10,438 |
| Vollyball system | 1 ls | 5,000.00 /ls | 5,000 |
| Scoreboards - basketball | 1 ea | 7,500.00 /ea | 7,500 |
| **Athletic & Recreational Equipment** | **136,600 sf** | **0.68 /sf** | **92,538** |
| **11-65 ATHLETIC/RECREATIONAL EQUIPMENT** | **136,600 sf** | **0.68 /sf** | **92,538** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **11-95 VOCATIONAL SHOP EQUIPMENT** | | | |
| **11.51.00 Vocational Shop Equipment** | | | |
| Vocational shop equipment | 1 ls | 25,000.00 /ls | 25,000 |
| ***- Welding booths - In Above*** | - | /- | |
| ***- Portable welding fumes extractor - In Above*** | - | /- | |
| ***- Paint spray hoods - In Above*** | - | /- | |
| ***- Portable wood working equipment dust collector - In HVAC*** | - | /- | |
| Kiln | 1 ls | 12,000.00 /ls | 12,000 |
| **Vocational Shop Equipment** | **136,600 sf** | **0.27 /sf** | **37,000** |
| **11-95 VOCATIONAL SHOP EQUIPMENT** | **136,600 sf** | **0.27 /sf** | **37,000** |
| **12-20 WINDOW TREATMENTS** | | | |
| **12.20.00 Window Treatments** | | | |
| Roller shades | 10,235 sf | 8.00 /sf | 81,880 |
| Roller shades - motorized | 970 sf | 18.00 /sf | 17,460 |
| Roller shades - interior | 3,300 sf | 8.00 /sf | 26,400 |
| Roller shades - doors | 50 ea | 150.00 /ea | 7,500 |
| **Window Treatments** | **136,600 sf** | **0.98 /sf** | **133,240** |
| **12-20 WINDOW TREATMENTS** | **136,600 sf** | **0.98 /sf** | **133,240** |
| **12-35 LAB CASEWORK** | | | |
| **11.53.00 Laboratory Equipment** | | | |
| Misc. lab equipment - Allowance | 1 ls | 25,000.00 /ls | 25,000 |
| Fume hoods | 3 ea | 11,000.00 /ea | 33,000 |
| Fume hoods - 2-sided | 1 ea | 15,000.00 /ea | 15,000 |
| **Laboratory Equipment** | **136,600 sf** | **0.53 /sf** | **73,000** |
| **12.35.53 Laboratory Casework** | | | |
| Base cabinet w/epoxy top | 30 lf | 600.00 /lf | 18,000 |
| Epoxy countertop - open below | 325 lf | 375.00 /lf | 121,875 |
| Epoxy backsplash | 635 lf | 60.00 /lf | 38,100 |
| Wall cabinets | 105 lf | 400.00 /lf | 42,000 |
| **Laboratory Casework** | **136,600 sf** | **1.61 /sf** | **219,975** |
| **12-35 LAB CASEWORK** | **136,600 sf** | **2.15 /sf** | **292,975** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **12-60 FIXED AUDITORIUM SEATING** | | | |
| **12.60.00 Multiple Seating** | | | |
| Fixed audience seating | 406 ea | 285.00 /ea | 115,710 |
| **Multiple Seating** | **136,600 sf** | **0.85 /sf** | **115,710** |
| **12-60 FIXED AUDITORIUM SEATING** | **136,600 sf** | **0.85 /sf** | **115,710** |
| **12-62 BLEACHERS** | | | |
| **12.60.00 Multiple Seating** | | | |
| Retractable Bleachers at Gym | 650 seat | 155.00 /seat | 100,750 |
| **Multiple Seating** | **136,600 sf** | **0.74 /sf** | **100,750** |
| **12-62 BLEACHERS** | **136,600 sf** | **0.74 /sf** | **100,750** |
| **14-20 ELEVATORS (TS)** | | | |
| **14.20.00 Elevators** | | | |
| Passenger elevators - cab, equipment | 1 ls | 40,000.00 /ls | 40,000 |
| Passenger elevators - stops | 4 stop | 45,000.00 /stop | 180,000 |
| **Elevators** | **136,600 sf** | **1.61 /sf** | **220,000** |
| **14-20 ELEVATORS (TS)** | **136,600 sf** | **1.61 /sf** | **220,000** |
| **21-01 FIRE PROTECTION (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Fire Protection) | (1) ls | 31,000.00 /ls | (31,000) |
| Trade support - lull, laborer for cleanup (Fire Protection) | 1 ls | 31,000.00 /ls | 31,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **21.01.00 Fire Suppression General Requirements** | | | |
| General requirements (management/design, permits, as-builts, coring, fire stopping) | 136,600 sf | 0.50 /sf | 68,300 |
| Hydraulic calculation & shop drawings | 1 ls | 8,000.00 /ls | 8,000 |
| 3D/BIM coordination | 1 ls | 10,000.00 /ls | 10,000 |
| **Fire Suppression General Requirements** | **136,600 sf** | **0.63 /sf** | **86,300** |
| **21.11.00 Fire Suppression - Water-Service Piping** | | | |
| Fire dept. inlet connection - 2-1/2" polished brass - 3 -way | 1 ea | 1,863.93 /ea | 1,864 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Fire Suppression - Water-Service Piping** | **136,600 sf** | **0.01 /sf** | **1,864** |
| **21.12.00 Fire-Suppression Standpipes** | | | |
| Standpipe - sch 40 black steel piping w/ fittings - 6" | 125 lf | 99.13 /lf | 12,391 |
| Drain riser - sch 40 black steel piping w/ fittings - 3" | 125 lf | 49.66 /lf | 6,208 |
| Fire hose valve - 2-1/2" | 12 ea | 353.36 /ea | 4,240 |
| Fire valve cabinet - steel - recessed | 12 ea | 894.50 /ea | 10,734 |
| **Fire-Suppression Standpipes** | **136,600 sf** | **0.25 /sf** | **33,573** |
| **21.13.13 Fire Suppression Wet-Pipe Sprinkler System** | | | |
| Sprinkler head - wet - recessed pendant | 903 ea | 125.42 /ea | 113,250 |
| Sprinkler head - wet - pendant or upright | 522 ea | 77.23 /ea | 40,313 |
| Sprinkler head - wet - sidewall | 151 ea | 87.51 /ea | 13,213 |
| Sprinkler head - wet - window | 34 ea | 87.51 /ea | 2,975 |
| Sprinkler head - extended coverage pendant or upright | 120 ea | 127.23 /ea | 15,267 |
| Sprinkler head - dry - sidewall (wet system) | 22 ea | 293.06 /ea | 6,447 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 1" | 3,465 lf | 23.99 /lf | 83,116 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 1-1/4" | 600 lf | 27.93 /lf | 16,757 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 1-1/2" | 5,200 lf | 30.66 /lf | 159,417 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 2" | 650 lf | 34.57 /lf | 22,468 |
| Sprinkler main piping black steel sch. 40 w/ fittings (avg. size) | 1,000 lf | 62.18 /lf | 62,184 |
| Sprinkler main piping black steel sch. 10 w/ fittings 3" | 450 lf | 36.32 /lf | 16,345 |
| Sprinkler main piping black steel sch. 10 w/ fittings 4" | 3,180 lf | 39.66 /lf | 126,127 |
| Sprinkler main piping black steel sch. 10 w/ fittings 6" | 500 lf | 69.39 /lf | 34,695 |
| Wet alarm valve - 6" | 1 ea | 3,656.71 /ea | 3,657 |
| Double check valve (BFP) assembly - 6" | 1 ea | 8,244.56 /ea | 8,245 |
| Butterfly valve - 6" | 2 ea | 1,566.71 /ea | 3,133 |
| Zone flow control valve - 4" | 7 ea | 2,521.71 /ea | 17,652 |
| Waterflow switch | 8 ea | 421.96 /ea | 3,376 |
| Tamper switch | 8 ea | 356.96 /ea | 2,856 |
| Water motor gong bell | 1 ea | 628.36 /ea | 628 |
| **Fire Suppression Wet-Pipe Sprinkler System** | **136,600 sf** | **5.51 /sf** | **752,122** |
| **21-01 FIRE PROTECTION (TS)** | **136,600 sf** | **6.40 /sf** | **873,859** |
| **22-01 PLUMBING (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Plumbing) | (1) ls | 83,000.00 /ls | (83,000) |
| Trade support - lull, laborer for cleanup (Plumbing) | 1 ls | 83,000.00 /ls | 83,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **22.00.05 PLUMBING - General Requirements** | | | |
| General requirements (management, permits, as-builts, coring, fire stopping) | 136,600 sf | 0.75 /sf | 102,450 |
| 3D/BIM coordination | 1 ls | 12,000.00 /ls | 12,000 |
| Core drilling | 1 ls | 10,000.00 /ls | 10,000 |
| Project management | 1 ls | 50,000.00 /ls | 50,000 |
| Kitchen Equipment Tie ins | 1 ls | 12,000.00 /ls | 12,000 |
| **PLUMBING - General Requirements** | **136,600 sf** | **1.37 /sf** | **186,450** |
| **22.07.00 PLUMBING - Insulation** | | | |
| Insulation/copper pipe/fiberglass | 7,975 lf | 8.44 /lf | 67,307 |
| Insulation/rainleader pipe/fiberglass/PVC jacketed/horiz. & vert. | 1,200 lf | 40.61 /lf | 48,737 |
| **PLUMBING - Insulation** | **136,600 sf** | **0.85 /sf** | **116,044** |
| **22.08.00 Plumbing Commissioning Support** | | | |
| Commissioning support/day | 5 day | 824.56 /day | 4,123 |
| **Plumbing Commissioning Support** | **136,600 sf** | **0.03 /sf** | **4,123** |
| **22.10.00 Plumbing Facility Water Distribution** | | | |
| Water meter w/remote readout - 4" | 1 ea | 2,285.75 /ea | 2,286 |
| Water sub-meter - avg. size | 1 ea | 1,561.84 /ea | 1,562 |
| Water sub-meter - 1.5 Circ | 1 ea | 1,261.84 /ea | 1,262 |
| Water sub-meter - 2" Domestic WH | 1 ea | 1,277.30 /ea | 1,277 |
| Backflow preventer/RPZ-BFP - dishwasher | 1 ea | 1,809.21 /ea | 1,809 |
| Backflow preventer/RPZ-BFP - 2" LW | 2 ea | 1,657.68 /ea | 3,315 |
| Backflow preventer/RPZ-BFP - 4" | 1 ea | 1,960.75 /ea | 1,961 |
| Pressure reducing valve/PRV - 1" | 1 ea | 1,159.21 /ea | 1,159 |
| Pressure reducing valve - 4" | 1 ea | 2,210.75 /ea | 2,211 |
| Recirculation pump/bronze/6.5 gpm - 1/8 hp (B&G Ecocirc) | 1 ea | 1,806.14 /ea | 1,806 |
| Recirculation pump/bronze/10 gpm - 1/6 hp (B&G #SSF-22) | 2 ea | 709.14 /ea | 1,418 |
| Expansion tank/ASME/potable - 9 gal (B&G #PTA-30V) | 1 ea | 1,250.61 /ea | 1,251 |
| TMV/master/hi-lo temp. | 1 ea | 2,759.21 /ea | 2,759 |
| Hose bibbs w/vac. breaker/encased - interior | 19 ea | 382.50 /ea | 7,268 |
| Hose bibbs/exterior/encased (Zurn #Z1320) | 3 ea | 452.07 /ea | 1,356 |
| Trap primers/electronic - 8 outlet (PPP #PT-8) | 8 ea | 1,359.91 /ea | 10,879 |
| Shock absorbers/12 - 33 fixture units (Shoktrol #200) | 3 ea | 269.77 /ea | 809 |
| Valve box/washing machine | 1 ea | 226.54 /ea | 227 |
| Valve box/ice machine | 3 ea | 176.54 /ea | 530 |
| Domestic water entrance UG/ductile iron - 4" | 20 lf | 306.14 /lf | 6,123 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **22.10.00 Plumbing Facility Water Distribution** | | | |
| Domestic water AG/type "L" copper/press fit ftgs. - avg. size | 525 lf | 23.31 /lf | 12,235 |
| Domestic water AG/type "L" copper/press fit - 1/2" TP | 1,120 lf | 13.02 /lf | 14,577 |
| Domestic water AG/type "L" copper/press fit - 1/2" NP | 800 lf | 13.02 /lf | 10,412 |
| Domestic water AG/type "L" copper/press fit - 1/2" | 1,460 lf | 13.02 /lf | 19,002 |
| Domestic water AG/type "L" copper/press fit - 3/4" NP | 450 lf | 15.76 /lf | 7,091 |
| Domestic water AG/type "L" copper/press fit - 3/4" | 1,240 lf | 15.76 /lf | 19,539 |
| Domestic water AG/type "L" copper/press fit - 1" NP | 100 lf | 20.56 /lf | 2,056 |
| Domestic water AG/type "L" copper/press fit - 1" | 50 lf | 20.57 /lf | 1,028 |
| Domestic water AG/type "L" copper/press fit - 1-1/4" NP | 100 lf | 25.23 /lf | 2,523 |
| Domestic water AG/type "L" copper/press fit - 1-1/4" | 115 lf | 25.23 /lf | 2,902 |
| Domestic water AG/type "L" copper/press fit - 1-1/2" | 400 lf | 30.31 /lf | 12,125 |
| Domestic water AG/type "L" copper/press fit - 2" NP | 450 lf | 41.16 /lf | 18,523 |
| Domestic water AG/type "L" copper/press fit - 2" | 300 lf | 41.16 /lf | 12,349 |
| Domestic water AG/type "L" copper/press fit - 2-1/2" | 285 lf | 66.38 /lf | 18,919 |
| Domestic water AG/type "L" copper/press fit - 3" | 480 lf | 84.91 /lf | 40,759 |
| Domestic water AG/type "L" copper/press fit - 4" | 100 lf | 116.00 /lf | 11,600 |
| Non-potable water AG/type "L" copper/solder - Hood Tie In | 60 lf | 22.94 /lf | 1,377 |
| - Domestic water piping accessories DOM | 6,095 lf | 2.78 /lf | 16,917 |
| - Domestic water piping accessories NP | 1,900 lf | 2.78 /lf | 5,274 |
| - Domestic water heat tracing/small bore piping All LHW | 1,900 lf | 25.97 /lf | 49,340 |
| - Domestic water pipe & equipment I.D. DOM | 6,095 lf | 1.61 /lf | 9,817 |
| - Domestic water pipe & equipment I.D. NP | 1,900 lf | 1.52 /lf | 2,881 |
| - Domestic water pressure gauges & thermometers | 12 ea | 120.61 /ea | 1,447 |
| - Domestic water support steel/additional to hangers & clamps | 1 ls | 1,074.56 /ls | 1,075 |
| - Layout Mech Room | 1 ls | 20,000.00 /ls | 20,000 |
| - Domestic water storage tank | 1 ls | 3.52 /ls | 4 |
| **Plumbing Facility Water Distribution** | **136,600 sf** | **2.67 /sf** | **365,038** |
| **22.13.00 PLUMBING - Sanitary, Waste & Vent Piping** | | | |
| Floor drain - 3" (#ZN415-6B) | 16 ea | 294.07 /ea | 4,705 |
| Floor drain - 4" (#ZN415-8B) | 4 ea | 353.07 /ea | 1,412 |
| Floor sink/12x12 - 4" (#Z1900) | 8 ea | 2,581.14 /ea | 20,649 |
| Floor cleanouts - 4" (#ZN1400) | 37 ea | 291.07 /ea | 10,770 |
| Wall cleanouts - 4" (#Z1468) | 10 ea | 101.08 /ea | 1,011 |
| Grease interceptor/interior/size 800/75 gpm/150 gal. | 2 ea | 4,291.56 /ea | 8,583 |
| 8000 Gallon Concrete Grease Trap | 1 ea | 17,649.12 /ea | 17,649 |
| Elevator sump pump/oil minder | 1 ea | 3,812.28 /ea | 3,812 |
| Grease interceptor flow control | 1 ea | 417.14 /ea | 417 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 2" | 220 lf | 31.98 /lf | 7,036 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 3" | 236 lf | 36.45 /lf | 8,602 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **22.13.00 PLUMBING - Sanitary, Waste & Vent Piping** | | | |
| Sanitary UG/cast iron single hub pipe & ftgs. - 4" | 610 lf | 44.78 /lf | 27,315 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 6" | 275 lf | 74.82 /lf | 20,576 |
| Sanitary AG/cast iron no hub pipe & ftgs. - avg. size Fixture Runouts | 1,560 lf | 47.33 /lf | 73,828 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 1-1/2" | 30 lf | 33.82 /lf | 1,015 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 2" | 750 lf | 34.83 /lf | 26,119 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 3" | 980 lf | 44.36 /lf | 43,468 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 4" | 495 lf | 52.52 /lf | 25,999 |
| Grease waste UG/cast iron single hub pipe & ftgs. - 2" | 40 lf | 31.98 /lf | 1,279 |
| Grease waste UG/cast iron single hub pipe & ftgs. - 3" | 20 lf | 36.45 /lf | 729 |
| Grease waste UG/cast iron single hub pipe & ftgs. - 4" | 220 lf | 44.78 /lf | 9,851 |
| Grease waste AG/cast iron no hub pipe & ftgs. - 2" | 55 lf | 34.83 /lf | 1,915 |
| Grease waste AG/cast iron no hub pipe & ftgs. - 3" | 65 lf | 44.36 /lf | 2,883 |
| Grease waste AG/cast iron no hub pipe & ftgs. - 4" | 70 lf | 52.52 /lf | 3,677 |
| - Sanitary waste & vent piping accessories | 5,626 lf | 1.77 /lf | 9,976 |
| - Sanitary piping & equipment I.D. | 5,626 lf | 1.81 /lf | 10,171 |
| **PLUMBING - Sanitary, Waste & Vent Piping** | **136,600 sf** | **2.51 /sf** | **343,448** |
| **22.14.00 PLUMBING - Rainleader Piping** | | | |
| Roof drain/#ZC100 - 4" | 9 ea | 298.07 /ea | 2,683 |
| Roof drain/#ZC100 - 5" | 2 ea | 387.84 /ea | 776 |
| Roof drain/#ZC100 - 6" | 14 ea | 387.84 /ea | 5,430 |
| Floor cleanouts - 4" (#ZN1400) | 6 ea | 291.07 /ea | 1,746 |
| Wall cleanouts - 4" (#Z1468) | 12 ea | 101.07 /ea | 1,213 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 4" | 90 lf | 44.77 /lf | 4,030 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 6" | 90 lf | 74.82 /lf | 6,734 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 8" | 70 lf | 103.25 /lf | 7,228 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 10" | 160 lf | 141.04 /lf | 22,566 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 12" | 25 lf | 186.99 /lf | 4,675 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 4" | 265 lf | 52.53 /lf | 13,919 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 6" | 410 lf | 81.16 /lf | 33,274 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 8" | 460 lf | 133.84 /lf | 61,565 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 10" | 10 lf | 198.47 /lf | 1,985 |
| - Rainleader piping accessories | 1,580 lf | 1.77 /lf | 2,802 |
| - Rainleader piping & equipment I.D. | 1,580 lf | 1.46 /lf | 2,314 |
| **PLUMBING - Rainleader Piping** | **136,600 sf** | **1.27 /sf** | **172,939** |
| **22.20.00 Plumbing Facility Gas Piping - Natural & LP Gas** | | | |
| Gas Flow Meter - avg. size | 1 ea | 1,857.68 /ea | 1,858 |
| Emergency gas shut off/cabinet w/1" solonoid & UL ball valve 1114, 1111A | 2 ea | 3,968.42 /ea | 7,937 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **22.20.00 Plumbing Facility Gas Piping - Natural & LP Gas** | | | |
| Emergency gas shut off/cabinet w/1-1/2" solonoid & UL ball valve KIT | 1 ea | 5,093.42 /ea | 5,093 |
| - Remote panic buttons | 2 ea | 828.07 /ea | 1,656 |
| Gas turret/single | 5 ea | 212.07 /ea | 1,060 |
| Gas turret/double | 5 ea | 320.54 /ea | 1,603 |
| Gas piping/sch 40 black steel CW t&c - 1" | 240 lf | 28.68 /lf | 6,882 |
| Gas piping/sch 40 black steel CW t&c - 1-1/4" | 120 lf | 34.14 /lf | 4,097 |
| Gas piping/sch 40 black steel CW t&c - 1-1/2" | 65 lf | 37.25 /lf | 2,421 |
| Gas piping/sch 40 black steel CW t&c - 2" | 10 lf | 42.28 /lf | 423 |
| Gas piping/sch 40 blk stl ERW weld - 2-1/2" | 30 lf | 45.73 /lf | 1,372 |
| Gas piping/sch 40 blk stl ERW weld - 3" | 75 lf | 54.12 /lf | 4,059 |
| Gas piping/sch 40 blk stl ERW weld - 4" | 60 lf | 87.71 /lf | 5,263 |
| Gas piping for generator | 250 lf | 80.00 /lf | 20,000 |
| Gas piping/sch 40 blk stl ERW weld - 8" | 25 lf | 180.43 /lf | 4,511 |
| - Gas piping accessories | 625 lf | 2.52 /lf | 1,577 |
| - Gas piping link seals | 1 ea | 404.61 /ea | 405 |
| - Gas piping & equipment I.D. | 625 lf | 28.95 /lf | 18,094 |
| **Plumbing Facility Gas Piping - Natural & LP Gas** | **136,600 sf** | **0.65 /sf** | **88,310** |
| **22.30.00 PLUMBING - Equipment** | | | |
| Domestic Boilers/gas fired/399 mbh (AO Smith #BTH-300A) | 2 ea | 15,618.42 /ea | 31,237 |
| Boiler Flues | 1 ls | 45,525.00 /ls | 45,525 |
| Water Heater Flues | 1 ls | 24,000.00 /ls | 24,000 |
| HWH/indirect fed - 300 gal | 1 ea | 7,418.42 /ea | 7,418 |
| **PLUMBING - Equipment** | **136,600 sf** | **0.79 /sf** | **108,180** |
| **22.40.00 PLUMBING - Fixtures** | | | |
| Water closet/wall mnt./carrier/flush valve | 22 ea | 1,330.12 /ea | 29,263 |
| Water closet/wall mnt./carrier/flush valve/ADA | 32 ea | 1,367.52 /ea | 43,761 |
| Urinal/wall mnt./carrier/flush valve | 18 ea | 1,202.85 /ea | 21,651 |
| Urinal/wall mnt./carrier/flush valve/ADA | 5 ea | 1,241.35 /ea | 6,207 |
| Lavatory/undermount/std 1-lever faucet | 54 ea | 523.24 /ea | 28,255 |
| Lavatory/undermount/std 1-lever faucet/ADA | 10 ea | 586.41 /ea | 5,864 |
| Lavatory/wall hung/std 1-lever faucet/carrier/ADA | 15 ea | 1,147.55 /ea | 17,213 |
| Sensor faucets/flush | 1 ls | 78,000.00 /ls | 78,000 |
| Mixing valve/single lav. (Leonard #170) | 85 ea | 348.84 /ea | 29,651 |
| P15 Sink/lay-in/1-bowl 20"x22"/std faucet/ADA | 2 ea | 1,560.75 /ea | 3,121 |
| P14 Sink/lay-in/1-bowl 20"x22"/std faucet/ADA Maker Space | 2 ea | 1,610.75 /ea | 3,221 |
| P7 Sink/lay-in/1-bowl 21"x15"/std faucet | 36 ea | 1,584.98 /ea | 57,059 |
| P9 Sink/lay-in/1-bowl 21"x15"/std faucet Art Room | 3 ea | 1,384.98 /ea | 4,155 |
| P9A Sink/lay-in/1-bowl 21"x15"/std faucet/ADA Art Room | 1 ea | 1,455.75 /ea | 1,456 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **22.40.00 PLUMBING - Fixtures** | | | |
| P7A Sink/lay-in/1-bowl 21"x15"/std faucet/ADA | 3 ea | 1,860.75 /ea | 5,582 |
| P8 Sinlk/lay-in/1-bowl/22"x16"/bubbler | 5 ea | 1,715.35 /ea | 8,577 |
| P-13 Sink/acid waste/undermount/std 2-lever faucet/ss - 21"x15"x10"D | 3 ea | 1,508.82 /ea | 4,526 |
| - Solids interceptors (Art Room sinks) | 4 ea | 552.64 /ea | 2,211 |
| Mop sink/floor mnt - 24"x24" | 5 ea | 1,349.01 /ea | 6,745 |
| P6 Shower stall/std valve & access./3'x3' fiberglass | 1 ea | 2,704.96 /ea | 2,705 |
| P6-A Shower stall/std valve & access./5'x3' fiberglass/ADA | 2 ea | 3,701.67 /ea | 7,403 |
| P13 Emergency eye wash station/mixing valve/sink mount | 3 ea | 1,106.71 /ea | 3,320 |
| Emergency shower/eye wash sta./mixing valve/cabinet mount | 7 ea | 3,540.35 /ea | 24,782 |
| Water cooler/bi-level/ADA | 10 ea | 4,418.42 /ea | 44,184 |
| - Plumbing fixtures offload & distribution | 239 ea | 103.07 /ea | 24,634 |
| - Plumbing fixtures rough-in | 239 ea | 128.07 /ea | 30,609 |
| **PLUMBING - Fixtures** | **136,600 sf** | **3.62 /sf** | **494,156** |
| **22.66.00 Plumbing Acid Neutrilization System** | | | |
| Acid neut. Tank/5 gallon - 1-sink (Orion style 5) | 1 ea | 622.14 /ea | 622 |
| Acid neut. tank/15 gallon - 3-sinks (Orion style 5) | 3 ea | 911.21 /ea | 2,734 |
| Acid neut. tank/55 gallon - | 2 ea | 1,912.28 /ea | 3,825 |
| - Limestone chips/50 lb. bag | 24 ea | 43.77 /ea | 1,050 |
| PH Monitoring (2) locations | 2 ea | 6,612.28 /ea | 13,225 |
| Floor drain - 6" (#ZN415-AA-8B) | 3 ea | 480.84 /ea | 1,443 |
| Floor cleanout/heavy duty - 4" (#ZN1400-K-AR) | 5 ea | 424.84 /ea | 2,124 |
| Wall cleanouts/#Z1468 - 4" | 5 ea | 101.07 /ea | 505 |
| Acid waste UG/sch 40 polypropylene fuseal & ftgs. - 3" | 20 lf | 58.29 /lf | 1,166 |
| Acid waste UG/sch 40 polypropylene fuseal & ftgs. - 4" | 230 lf | 68.91 /lf | 15,849 |
| Tie-ins to Lab Hoods acid waste & vent - A/G | 3 ea | 815.35 /ea | 2,446 |
| Acid waste AG/sch 40 polypropylene fuseal & ftgs. - 2" | 800 lf | 51.44 /lf | 41,154 |
| Acid waste AG/sch 40 polypropylene fuseal & ftgs. - 3" | 400 lf | 65.67 /lf | 26,269 |
| Acid waste AG/sch 40 polypropylene fuseal & ftgs. - 4" | 360 lf | 77.44 /lf | 27,877 |
| - Acid waste & vent piping accessories | 1,810 lf | 2.02 /lf | 3,662 |
| - Acid waste piping & equipment I.D. | 1,810 lf | 2.56 /lf | 4,636 |
| **Plumbing Acid Neutrilization System** | **136,600 sf** | **1.09 /sf** | **148,587** |
| **22.90.00 Plumbing - Other** | | | |
| Wiring PH Monitor and Misc Control | 1 ls | 6,000.00 /ls | 6,000 |
| **Plumbing - Other** | **136,600 sf** | **0.04 /sf** | **6,000** |
| **22-01 PLUMBING (TS)** | **136,600 sf** | **14.89 /sf** | **2,033,274** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **23-01 HVAC (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (HVAC) | (1) ls | 343,000.00 /ls | (343,000) |
| Trade support - lull, laborer for cleanup (HVAC) | 1 ls | 343,000.00 /ls | 343,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **23.00.05 HVAC - General Requirements** | | | |
| General requirements (sq. ft.) | 136,600 sf | 1.15 /sf | 157,090 |
| 3D/BIM coordination | 1 ls | 100,000.00 /ls | 100,000 |
| **HVAC - General Requirements** | **136,600 sf** | **1.88 /sf** | **257,090** |
| **23.05.93 HVAC Testing Adjusting & Balancing (TAB)** | | | |
| Testing & balancing/cost per sq. ft. | 136,600 sf | 0.65 /sf | 88,790 |
| **HVAC Testing Adjusting & Balancing (TAB)** | **136,600 sf** | **0.65 /sf** | **88,790** |
| **23.07.00 HVAC - Insulation** | | | |
| Insulation/ductwork/blanket wrap | 83,500 sf | 3.55 /sf | 296,088 |
| Insulation/ductwork/weatherproof exposed | 4,500 sf | 12.89 /sf | 57,986 |
| Insulation/pipe/copper | 14,483 lf | 7.09 /lf | 102,715 |
| Insulation/pipe/weld | 3,838 lf | 12.50 /lf | 47,975 |
| **HVAC - Insulation** | **136,600 sf** | **3.70 /sf** | **504,764** |
| **23.08.00 HVAC - Commissioning Support** | | | |
| Commissioning support/lump sum | 1 ls | 15,000.00 /ls | 15,000 |
| **HVAC - Commissioning Support** | **136,600 sf** | **0.11 /sf** | **15,000** |
| **23.09.00 HVAC - Automatic Temperature Controls** | | | |
| Automatic temperature controls/cost per sq. ft. | 136,600 sf | 0.25 /sf | 34,150 |
| ATC - Air valve/hood exhaust/HEX | 3 ea | 4,194.32 /ea | 12,583 |
| ATC - Air valves/no coil control wiring - 3 pts./fume hood | 9 pnt | 437.00 /pnt | 3,933 |
| ATC - RTU's/custom - 30 pts. | 240 pnt | 1,303.18 /pnt | 312,763 |
| ATC - MUA units - 10 pts. | 10 pnt | 759.44 /pnt | 7,594 |
| ATC - Exhaust fans - 3 pts. | 18 pnt | 711.10 /pnt | 12,800 |
| ATC - Life safty fans - 8 pts. | 32 pnt | 766.15 /pnt | 24,517 |
| ATC - Lab exhaust fans - 5 pts./fan | 25 pnt | 766.15 /pnt | 19,154 |
| ATC - Boilers/modular - 10 pts. | 20 pnt | 821.19 /pnt | 16,424 |
| ATC - Pumps - 4 pts. | 16 pnt | 766.15 /pnt | 12,258 |
| ATC - VFD wiring for pumps (remote mount) - 4 pts. | 16 pnt | 763.91 /pnt | 12,223 |
| ATC - Circulators - 2 pts. | 4 pnt | 488.68 /pnt | 1,955 |
| ATC - Chillers - 15 pts. | 15 pnt | 1,303.18 /pnt | 19,548 |
| ATC - VAV box/no coil (ATC furn./factory install controls) 2 pts. | 310 pnt | 408.36 /pnt | 126,592 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **23.09.00 HVAC - Automatic Temperature Controls** | | | |
| ATC - Fintube radiation zones - 2 pts. | 20 pnt | 381.96 /pnt | 7,639 |
| ATC - electric fintube radiation zones - 2 pts. | 4 pnt | 381.95 /pnt | 1,528 |
| ATC - Cabinet unit heaters - 3 pts. | 42 pnt | 381.96 /pnt | 16,042 |
| ATC - Unit heaters - 3 pts. | 6 pnt | 381.95 /pnt | 2,292 |
| ATC - Radiant ceiling panel zones - 2 pts. | 246 pnt | 381.96 /pnt | 93,961 |
| ATC - Plumbing points - 10 pts. | 10 pnt | 595.50 /pnt | 5,955 |
| ATC - Elctrical points - 10 pts. | 10 pnt | 595.50 /pnt | 5,955 |
| **HVAC - Automatic Temperature Controls** | **136,600 sf** | **5.49 /sf** | **749,864** |
| **23.21.13 Hydronic Piping** | | | |
| Hot water s&r/type "L" copper solder - 3/4" | 8,970 lf | 20.16 /lf | 180,835 |
| Hot water s&r/type "L" copper solder - 1" | 1,760 lf | 25.01 /lf | 44,018 |
| Hot water s&r/type "L" copper solder - 1-1/4" | 1,260 lf | 28.57 /lf | 35,998 |
| Hot water s&r/type "L" copper solder - 1-1/2" | 890 lf | 32.82 /lf | 29,210 |
| Hot water s&r/type "L" copper solder - 2" | 1,550 lf | 41.25 /lf | 63,937 |
| Hot water s&r/sch 40 blk stl ERW weld - 2-1/2" | 605 lf | 50.55 /lf | 30,583 |
| Hot water s&r/sch 40 blk stl ERW weld - 3" | 475 lf | 59.42 /lf | 28,225 |
| Hot water s&r/sch 40 blk stl ERW weld - 4" | 756 lf | 82.30 /lf | 62,219 |
| Hot water s&r/sch 40 blk stl ERW weld - 6" | 520 lf | 134.07 /lf | 69,716 |
| Hot water s&r/sch 40 blk stl ERW weld - 8" | 220 lf | 167.74 /lf | 36,903 |
| Glycol water s&r/type "L" copper solder - 2" | 53 lf | 41.25 /lf | 2,186 |
| Glycol water s&r/sch 40 blk stl ERW weld - 2-1/2" | 47 lf | 50.55 /lf | 2,376 |
| Glycol water s&r/sch 40 blk stl ERW weld - 3" | 90 lf | 59.42 /lf | 5,348 |
| Glycol water s&r/sch 40 blk stl ERW weld - 4" | 152 lf | 82.30 /lf | 12,510 |
| Glycol water s&r/sch 40 blk stl ERW weld - 6" | 910 lf | 134.07 /lf | 122,004 |
| Glycol water s&r/sch 40 blk stl ERW weld - 8" | 110 lf | 167.74 /lf | 18,451 |
| - Hydronic piping accessories | 18,368 lf | 2.53 /lf | 46,506 |
| **Hydronic Piping** | **136,600 sf** | **5.79 /sf** | **791,024** |
| **23.21.23 Hydronic Pumps & Accessories** | | | |
| Pump/base mount/790 gpm (HW) | 2 ea | 8,167.68 /ea | 16,335 |
| Chilled water pump house (pumps & accesories, enclosure, piping, unit heater | 1 ls | 226,667.68 /ls | 226,668 |
| - Suction diffusers | 2 ea | 1,460.58 /ea | 2,921 |
| - Flex connector/HVAC pumps | 4 ea | 556.35 /ea | 2,225 |
| - Triple duty valves | 2 ea | 2,312.69 /ea | 4,625 |
| Air separators | 1 ea | 4,333.84 /ea | 4,334 |
| Expansion tanks/ASME | 2 ea | 7,167.68 /ea | 14,335 |
| **Hydronic Pumps & Accessories** | **136,600 sf** | **1.99 /sf** | **271,444** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **23.25.00 HVAC Water Treatment** | | | |
| Chemical treatment (lump sum) | 1 ls | 20,000.00 /ls | 20,000 |
| Glycol feed/50 gal. tank w/pump (Neptune #G-50-1) | 2 ea | 5,272.92 /ea | 10,546 |
| - Glycol solution/40% propylene | 1,000 gal | 25.21 /gal | 25,212 |
| **HVAC Water Treatment** | **136,600 sf** | **0.41 /sf** | **55,757** |
| **23.30.00 HVAC - Sheetmetal & Fans** | | | |
| Sheetmetal & accessories/galvanized | 111,320 lb | 11.04 /lb | 1,228,973 |
| Sheetmetal & accessories/galvanized (perforated) | 869 lb | 14.49 /lb | 12,592 |
| Sheetmetal & accessories/galvanized (smoke exhasut) | 9,735 lb | 11.04 /lb | 107,474 |
| Sheetmetal & accessories/galvanized (perforated liner) | 4,000 lb | 14.49 /lb | 57,960 |
| Sheetmetal & accessories/stainless steel (dishwasher) | 350 lb | 22.28 /lb | 7,798 |
| Sheetmetal & accessories/welded stainless steel (kitchen exhaust) | 1,060 lb | 29.78 /lb | 31,567 |
| Sheetmetal & accessories/welded stainless steel (kiln exhaust) | 500 lb | 29.78 /lb | 14,890 |
| Sheetmetal & accessories/welded stainless steel (3 - fume hoods) | 2,700 lb | 29.78 /lb | 80,406 |
| Sheetmetal & accessories/fabric/1-row cable (DuctSox) - 20" | 405 lf | 76.50 /lf | 30,982 |
| Sheetmetal & accessories/fabric/1-row cable (DuctSox) - 24" | 305 lf | 81.29 /lf | 24,792 |
| Duct enclosure (roof) | 1 ea | 5,424.10 /ea | 5,424 |
| SM - Flue piping/double wall/stainless steel/6" pipe - linear foot DWH | 600 lf | 97.98 /lf | 58,786 |
| SM - Flue piping/double wall/stainless steel/6" fittings - each DWH | 16 ea | 122.47 /ea | 1,960 |
| SM - Flue piping/double wall/stainless steel/6" fittings - each DWH | 8 lf | 122.47 /lf | 980 |
| SM - Diffusers, registers & grilles | 136,600 sf | 0.20 /sf | 27,320 |
| SM - Linear slot diffusers (supply) | 6 ea | 465.39 /ea | 2,792 |
| ***SM - Linear slot diffusers (exhaust) - architectural*** | ***lf*** | ***/lf*** | |
| SM - Displ. Diffuser/Floor Mnt. | 156 ea | 1,289.88 /ea | 201,221 |
| SM - Combination fire/smoke dampers/louver type/UL | 20 ea | 776.53 /ea | 15,530 |
| SM - Motorized damper | 14 ea | 1,107.92 /ea | 15,511 |
| SM - Smoke detectors/duct mount | 40 ea | 747.47 /ea | 29,899 |
| SM - Sound attenuators/in-line/std. gauge | 239,000 cfm | 0.55 /cfm | 131,341 |
| SM - Kitchen exhaust hood/st. steel/install only (by KES) | 1 ea | 2,339.28 /ea | 2,339 |
| SM - Dishwasher exhaust hood/st. steel/install only (by KES) | 1 ea | 1,559.52 /ea | 1,560 |
| **HVAC - Sheetmetal & Fans** | **136,600 sf** | **15.32 /sf** | **2,092,097** |
| **23.34.00 HVAC Fans - Exhaust & Supply** | | | |
| SEF-1-4 | 4 ea | 17,339.28 /ea | 69,357 |
| EF-3&4 /centrifugal downblast/roof/direct drive - 500 cfm | 2 ea | 1,069.31 /ea | 2,139 |
| EF-1&2 /centrifugal downblast/roof/direct drive - 2,500 cfm | 2 ea | 1,771.24 /ea | 3,542 |
| KEF-1&2/centrifugal upblast/roof | 2 ea | 2,734.82 /ea | 5,470 |
| FEF-1,2,3,4,5 Lab exhaust fan/roof - 1,200 cfm | 5 ea | 9,084.82 /ea | 45,424 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **HVAC Fans - Exhaust & Supply** | **136,600 sf** | **0.92 /sf** | **125,932** |
| **23.35.00 Specialty Exhaust Systems** | | | |
| Dust collection system | 1 ea | 17,339.28 /ea | 17,339 |
| Kiln exhaust | 1 ls | 5,500.00 /ls | 5,500 |
| **Specialty Exhaust Systems** | **136,600 sf** | **0.17 /sf** | **22,839** |
| **23.36.00 Air Terminal Units - VAV's, CAV's &FPB's** | | | |
| Variable air volume box - small | 12 ea | 533.15 /ea | 6,398 |
| Variable air volume box - medium | 143 ea | 668.62 /ea | 95,612 |
| **Air Terminal Units - VAV's, CAV's &FPB's** | **136,600 sf** | **0.75 /sf** | **102,010** |
| **23.50.00 HVAC - Central Heating Equipment** | | | |
| Boiler/HW/gas/high eff. cond. - 4,000 mbh Riello AR 4000 | 2 ea | 57,501.52 /ea | 115,003 |
| Boiler circulator pump | 2 ea | 1,708.46 /ea | 3,417 |
| Boiler combustion air/galvanized steel 10" | 200 lf | 38.00 /lf | 7,600 |
| Flue piping/double wall/stainless steel 10" | 205 lf | 185.00 /lf | 37,925 |
| **HVAC - Central Heating Equipment** | **136,600 sf** | **1.20 /sf** | **163,945** |
| **23.60.00 HVAC - Central Cooling Equipment** | | | |
| Chiller/air cooled - 370 tons | 1 ea | 381,153.80 /ea | 381,154 |
| Buffer tanks/Lochinvar - 300 gals. | 1 ea | 8,750.76 /ea | 8,751 |
| **HVAC - Central Cooling Equipment** | **136,600 sf** | **2.85 /sf** | **389,905** |
| **23.70.00 HVAC - Central Air Handling Equipment** | | | |
| RTU-1-4 Classrooms (service enclosure, HW&CHW coils, energy recovery) | 80,000 cfm | 15.75 /cfm | 1,260,000 |
| RTU-5 Gymnasium (service enclosure, HW&CHW coils, energy recovery) | 15,000 cfm | 16.25 /cfm | 243,750 |
| RTU-6 Auditorium (service enclosure, HW&CHW coils, energy recovery) | 12,000 cfm | 16.25 /cfm | 195,000 |
| RTU-7 Lockers (service enclosure, HW&CHW coils, energy recovery) | 2,000 cfm | 18.25 /cfm | 36,500 |
| MAU-1 Make-up air unit/HW&CHW coil/ | 5,000 cfm | 7.25 /cfm | 36,250 |
| **HVAC - Central Air Handling Equipment** | **136,600 sf** | **12.97 /sf** | **1,771,500** |
| **23.80.20 Mini-Split AC & Heat Pump Systems** | | | |
| Mini-split AC system/1-zone/wall mnt./cool only - 12 mbh | 1 ea | 2,072.92 /ea | 2,073 |
| Mini-split AC system/1-zone/wall mnt./cool only - 18 mbh | 5 ea | 2,681.66 /ea | 13,408 |
| Mini-split AC system/1-zone/wall mnt./cool only - 24 mbh | 2 ea | 2,956.03 /ea | 5,912 |
| Mini-split refrigeration line set/6-12 mbh - 50' | 2 ea | 584.88 /ea | 1,170 |
| Mini-split refrigeration line set/15-18 mbh - 50' | 10 ea | 599.88 /ea | 5,999 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **23.80.20 Mini-Split AC & Heat Pump Systems** | | | |
| Mini-split refrigeration line set/24-30 mbh - 50' | 4 ea | 614.88 /ea | 2,460 |
| Mini-split condensate drains/type"L" copper | 450 lf | 19.43 /lf | 8,744 |
| A/C cond. pump | 8 ea | 253.74 /ea | 2,030 |
| INS - Mini-split Insulation/copper pipe | 450 lf | 6.87 /lf | 3,090 |
| ATC - Mini-split condensing units (w/factory controls) | 8 ea | 879.76 /ea | 7,038 |
| ATC - Mini-split indoor units (w/factory controls) | 8 ea | 587.35 /ea | 4,699 |
| **Mini-Split AC & Heat Pump Systems** | **136,600 sf** | **0.42 /sf** | **56,622** |
| **23.82.00 Heating & Cooling Terminal Equipment** | | | |
| Radiant ceiling panels/24" wide - ft. | 1,450 lf | 120.00 /lf | 174,000 |
| FTR-2 Finned-tube radiation w/enclosure - 1 row | 260 lf | 194.24 /lf | 50,502 |
| FTR-1 Finned-tube radiation w/enclosure - 2 row | 570 lf | 259.37 /lf | 147,841 |
| FTR-3 Finned-tube radiation w/enclosure - 2 row | 40 lf | 297.49 /lf | 11,900 |
| Fin-tube radiation/electric - 2 kW | 8 ea | 739.88 /ea | 5,919 |
| Cabinet unit heater/hot water/wall mount/recessed - avg. size | 4 ea | 1,573.62 /ea | 6,294 |
| Cabinet unit heater/hot water/ceiling mount - avg. size | 10 ea | 1,749.51 /ea | 17,495 |
| Unit heater/hot water/horiz./propeller - avg. size | 2 ea | 1,092.41 /ea | 2,185 |
| **Heating & Cooling Terminal Equipment** | **136,600 sf** | **3.05 /sf** | **416,136** |
| **23.85.00 HVAC Equipment VFD's** | | | |
| Misc. VFD's | 1 ls | 35,000.00 /ls | 35,000 |
| VFD w/keypad/disconnect/bypass/NEMA 1 - HW pumps | 2 ea | 6,028.47 /ea | 12,057 |
| ***VFD w/keypad/disconnect/bypass/NEMA 1 - CHW pumps w/ pump house*** | ***ea*** | ***/ea*** | |
| **HVAC Equipment VFD's** | **136,600 sf** | **0.34 /sf** | **47,057** |
| **23.90.00 HVAC Equipment Rigging/Setting/Start Up** | | | |
| Equipment hoisting/rigging/setting/start-up | 136,600 sf | 1.50 /sf | 204,900 |
| **HVAC Equipment Rigging/Setting/Start Up** | **136,600 sf** | **1.50 /sf** | **204,900** |
| **23-01 HVAC (TS)** | **136,600 sf** | **59.49 /sf** | **8,126,676** |
| **26-01 ELECTRICAL (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Electrical) | (1) ls | 230,000.00 /ls | (230,000) |
| Trade support - lull, laborer for cleanup (Electrical) | 1 ls | 230,000.00 /ls | 230,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **26.00.05 Electrical General Requirements** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.00.05 Electrical General Requirements** | | | |
| LEED Silver - premium (T.B.D.) | 1 ls | 9,400.00 /ls | 9,400 |
| Temp light stringers & GFCI power | 136,600 sf | 0.35 /sf | 47,810 |
| Temp 480Y/277V electrical service (400A) | 3 ea | 18,226.22 /ea | 54,679 |
| Temp power for welders | 2 ea | 2,398.27 /ea | 4,797 |
| Temp power for trailers | 4 ea | 1,302.42 /ea | 5,210 |
| Temp internet connection for trailers | 4 ea | 1,854.17 /ea | 7,417 |
| Material handling / project mgmt. | 250 mh | 97.71 /mh | 24,428 |
| 3D/BIM coordination | 500 mh | 97.71 /mh | 48,856 |
| Record drawings / as-builts | 1 ea | 5,318.52 /ea | 5,319 |
| Seismic & testing (panels, generator, lighting control, fire alarm) | 1 ls | 18,800.00 /ls | 18,800 |
| Coring - patching - firestopping | 136,600 sf | 0.09 /sf | 12,840 |
| Project phasing (re-mobilization) | 1 ls | 9,400.00 /ls | 9,400 |
| Hoisting & rigging (generator & switchboard) | 2 ls | 7,050.00 /ls | 14,100 |
| **Electrical General Requirements** | **136,600 sf** | **1.93 /sf** | **263,055** |
| **26.05.05 Demolition for Electrical** | | | |
| Relocate existing emergency call box (provide new concrete base) | 1 ea | 2,994.80 /ea | 2,995 |
| Remove existing exterior site light fixture | 11 ea | 672.85 /ea | 7,401 |
| **Demolition for Electrical** | **136,600 sf** | **0.08 /sf** | **10,396** |
| **26.05.08 Electrical Distribution** | | | |
| Feeder (PVC/CU) - 150A [generator / LS] | 135 lf | 22.18 /lf | 2,994 |
| Feeder (PVC/CU) - 225A [generator / OS] | 135 lf | 33.46 /lf | 4,517 |
| Feeder (PVC/CU) - 400A [generator / LR] (exterior) | 135 lf | 56.93 /lf | 7,685 |
| Feeder (PVC/CU) - 2500A [secondary] | 105 lf | 414.00 /lf | 43,470 |
| Empty conduit - sch 40 PVC: 1 x 4" [generator] | 135 lf | 9.86 /lf | 1,330 |
| Empty conduit - sch 40 PVC: 1 x 4" [secondary / spare] | 105 lf | 9.86 /lf | 1,035 |
| Empty conduit - sch 40 PVC: 2 x 4" [primary] | 250 lf | 17.66 /lf | 4,415 |
| Magnetic warning tape - 1/8" | 875 lf | 4.37 /lf | 3,826 |
| Pole riser (GRC - 4"C) | 2 ea | 2,343.85 /ea | 4,688 |
| Electric manhole - 6'x12x7' | 1 ea | 6,773.56 /ea | 6,774 |
| Cast iron manhole frame/cover, 32"D x 6'H grade rings | 1 ea | 1,140.93 /ea | 1,141 |
| 12" x 12" x 12"D ground mounted pullbox (Quazite #PC1212HG00 w/ Cover) | 2 ea | 752.15 /ea | 1,504 |
| Hand hole & cover - 4'x4'x4' | 6 ea | 1,937.11 /ea | 11,623 |
| 17"x30"x12"D ground pullbox (Quazite #PC1730BA12 w/ cover) | 11 ea | 1,078.60 /ea | 11,865 |
| 24" x 36" x 24"D ground mounted pullbox (Quazite #Pg2436BC-24 w/ Cover) | 1 ea | 1,718.39 /ea | 1,718 |
| **Electrical Distribution** | **136,600 sf** | **0.80 /sf** | **108,584** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.05.26 Grounding & Bonding for Electrical Systems** | | | |
| Building grounding & bonding | 136,600 sf | 0.11 /sf | 15,408 |
| Manhole / racking grounding & bonding | 1 ea | 701.05 /ea | 701 |
| Exterior (utility) transformer grounding & bonding | 1 ea | 1,066.05 /ea | 1,066 |
| Generator grounding & bonding | 1 ea | 1,066.05 /ea | 1,066 |
| SPD grounding (internal and external) | 47 ea | 120.29 /ea | 5,653 |
| Dry-type transformer grounding | 4 ea | 213.22 /ea | 853 |
| Copper ground bar - 2"x1/4" (ea.) | 5 ea | 280.03 /ea | 1,400 |
| Bare copper wire - #4/0 [duct bank] | 875 lf | 4.99 /lf | 4,368 |
| **Grounding & Bonding for Electrical Systems** | **136,600 sf** | **0.22 /sf** | **30,516** |
| **26.05.83 Equipment Wiring** | | | |
| Science Classrooms - CO system solenoid shutdown- 120V power & control wiring | 2 ea | 5,326.40 /ea | 10,653 |
| Kitchen - Ansul system - 120V power & control wiring | 1 ea | 10,237.00 /ea | 10,237 |
| Gym scoreboards and shot clocks - wiring only, F&I by Div. 11 | 2 ea | 5,344.80 /ea | 10,690 |
| Feeder (MC) - 20A (kitchen equipment - x42) | 3,150 lf | 5.75 /lf | 18,111 |
| Feeder (MC) - 30A (kitchen equipment - x2) | 200 lf | 5.87 /lf | 1,173 |
| 1" PVC - 30A (3#8 & #10G) | 250 lf | 10.29 /lf | 2,573 |
| Feeder (MC) - 40A (kitchen equipment - x1) | 100 lf | 7.01 /lf | 701 |
| Feeder (MC) - 60A (kitchen equipment - x2) | 200 lf | 10.55 /lf | 2,110 |
| Power for automatic temperature control panels (BMS) | 12 ea | 460.91 /ea | 5,531 |
| Electric heat trace power (cables, sensors, controllers by Div. 21 / 22) | 1,900 lf | 3.50 /lf | 6,650 |
| Service switch: 20A/3P, NEMA-1 | 1 ea | 107.43 /ea | 107 |
| Fused Disco: 20A/3P, NEMA-1 | 7 ea | 323.22 /ea | 2,263 |
| Fused Disco: 100A/3P, NEMA-1 | 2 ea | 1,185.41 /ea | 2,371 |
| Fused Disco: 200A/3P, NEMA-1 | 3 ea | 1,555.38 /ea | 4,666 |
| Fused Disco: 1000A/3P, NEMA-1 | 2 ea | 7,290.94 /ea | 14,582 |
| Wire gymnasum equipment SMC control stations (furnished by others) | 8 ea | 1,058.23 /ea | 8,466 |
| Electric vehicle charging station / dual pedestal / cable mgmt. | 3 ea | 10,512.40 /ea | 31,537 |
| Wire motors and controllers | 15 ea | 821.28 /ea | 12,319 |
| Kitchen equipment final connections (includes flexible whip) | 47 ea | 72.36 /ea | 3,401 |
| Mount & wire VFD's (furnished by Div. 23) | 8 ea | 646.55 /ea | 5,172 |
| MAU (5000cfm) - circuit / disconnect (3R) / connection | 1 ea | 2,503.41 /ea | 2,503 |
| RTU's - circuit / disconnect (3R) / connection (small) | 3 ea | 4,736.19 /ea | 14,209 |
| RTU's - circuit / disconnect (3R) / connection (large) | 4 ea | 7,010.29 /ea | 28,041 |
| Mini-split systems (indoor/outdoor) - circuits / disconnects (3R) / connections | 8 ea | 3,225.23 /ea | 25,802 |
| Chiller (370T) - circuit / disconnect (3R) / connection | 1 ea | 25,825.56 /ea | 25,826 |
| Smoke exhaust fans - circuit / disconnect / connection (100A) | 4 ea | 2,400.01 /ea | 9,600 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.05.83 Equipment Wiring** | | | |
| Kitchen exhaust fans - circuit / disconnect / connection | 2 ea | 1,420.91 /ea | 2,842 |
| Kiln exhaust system - circuit / disconnect / connection | 1 ea | 2,655.30 /ea | 2,655 |
| Dust collection system - circuit / disconnect / connection | 1 ea | 3,579.00 /ea | 3,579 |
| Fume hood exhaust fans - circuit / disconnect / connection | 5 ea | 1,214.10 /ea | 6,071 |
| Exhaust fans - circuit / disconnect / connection | 4 ea | 1,214.11 /ea | 4,856 |
| Power to electronic trap primers - 120V | 8 ea | 100.19 /ea | 801 |
| Hot water pumps - circuit / disconnect / connection | 2 ea | 1,673.87 /ea | 3,348 |
| Boilers - circuit / disconnect / connection | 2 ea | 1,204.71 /ea | 2,409 |
| Chilled water pump house pumps & heaters - circuits / disconnects / connections | 1 ls | 6,158.00 /ls | 6,158 |
| Hot water heater - circuit / service switch / connection | 1 ea | 591.53 /ea | 592 |
| Cabinet unit heaters - circuit / service switch / connection | 14 ea | 868.28 /ea | 12,156 |
| Unit heaters - circuit / service switch / connection | 2 ea | 868.28 /ea | 1,737 |
| Elevator sump pump - circuit / disconnect (3R) / connection | 1 ea | 1,247.28 /ea | 1,247 |
| Domestic boilers - circuit / disconnect (3R) / connection | 2 ea | 1,247.28 /ea | 2,495 |
| Recirculation pumps - circuit / disconnect / connection | 3 ea | 997.87 /ea | 2,994 |
| Glycol feed pumps - circuit / disconnect / connection | 2 ea | 997.87 /ea | 1,996 |
| Boiler circulation pumps - circuit / disconnect / connection | 2 ea | 997.87 /ea | 1,996 |
| Fin-tube radiators (2kW) - circuit / disconnect / connection | 8 ea | 1,847.40 /ea | 14,779 |
| VAV's - circuit / disconnect / connection | 155 ea | 298.83 /ea | 46,318 |
| Acid neutralization tanks / PH monitoring - circuit / connection | 2 ea | 965.80 /ea | 1,932 |
| **Equipment Wiring** | **136,600 sf** | **2.78 /sf** | **380,253** |
| **26.09.23 Lighting Control Devices** | | | |
| On-site programming & startup (manufacturer) | 1 ls | 3,913.41 /ls | 3,913 |
| Single pole switch (120/277V) | 13 ea | 65.04 /ea | 845 |
| Key op switch (120/277V) | 2 ea | 72.44 /ea | 145 |
| Three position momentary contact switch | 1 ea | 226.42 /ea | 226 |
| Ceiling PIR occupancy sensor (24VDC) | 323 ea | 247.23 /ea | 79,854 |
| Occupancy sensor power packs (120V) | 200 ea | 82.04 /ea | 16,408 |
| Wall dimmer switch (0-10V) | 227 ea | 131.04 /ea | 29,746 |
| Photocells (daylight harvesting) | 84 ea | 265.06 /ea | 22,265 |
| Universal dimming room controller, 1-channel | 50 ea | 536.88 /ea | 26,844 |
| ALCS master switching / dimming station | 1 ea | 821.83 /ea | 822 |
| Plug load controllers (20A/120V) | 50 ea | 300.80 /ea | 15,040 |
| Emergency lighting transfer (bypass relay) - non-dimming | 30 ea | 236.81 /ea | 7,104 |
| Lighting contactor - 12 pole (exterior lighting) | 1 ea | 1,899.98 /ea | 1,900 |
| Astronomical time clock | 1 ea | 919.97 /ea | 920 |
| Rough in for Theater Lighting - Allowance | 1 allw | 9,400.01 /allw | 9,400 |
| Power for Theater Lighting - Allowance | 1 allw | 28,199.87 /allw | 28,200 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.09.23 Lighting Control Devices** | | | |
| Sub lighting control panels | 3 ea | 2,394.56 /ea | 7,184 |
| Master lighting control panel | 1 ea | 4,383.41 /ea | 4,383 |
| Energy control unit | 1 ea | 2,157.58 /ea | 2,158 |
| System server unit | 1 ea | 1,316.75 /ea | 1,317 |
| Network Ethernet switch | 1 ea | 2,270.85 /ea | 2,271 |
| MC Cable (12/2) - 20A | 12,500 lf | 3.45 /lf | 43,126 |
| MC Cable (12/3) - 20A | 3,500 lf | 3.87 /lf | 13,541 |
| EMT (12/2) - 20A | 2,000 lf | 6.70 /lf | 13,404 |
| EMT (12/2) - 20A | 50 lf | 7.13 /lf | 356 |
| RJ45 Cable, 25LF (plenum-rated) | 407 ea | 72.10 /ea | 29,344 |
| RJ45 Cable, 50LF (plenum rated) | 228 ea | 111.05 /ea | 25,318 |
| **Lighting Control Devices** | **136,600 sf** | **2.83 /sf** | **386,033** |
| **26.10.00 Medium Voltage Electrical Distribution** | | | |
| Utility meter socket (meter by Util. Co.) | 1 ea | 289.66 /ea | 290 |
| CT meter enclosure for switchboard | 1 ea | 1,462.26 /ea | 1,462 |
| **Medium Voltage Electrical Distribution** | **136,600 sf** | **0.01 /sf** | **1,752** |
| **26.27.00 Low-Voltage Distribution Equipment** | | | |
| Circuit breaker - 20A/1P (panel) | 1 ea | 149.86 /ea | 150 |
| Switchboard: 3000A bus, 2500A rated MCB (100%), 480/277V, 3PH, 65kAIC | 1 ea | 45,417.04 /ea | 45,417 |
| Externally mounted SPD's | 6 ea | 3,131.70 /ea | 18,790 |
| Panelboard: 100A, 42-circuit | 14 ea | 2,550.41 /ea | 35,706 |
| Panelboard: 225A, 42-circuit | 9 ea | 3,420.66 /ea | 30,786 |
| Panelboard: 225A, 84-circuit | 9 ea | 4,338.66 /ea | 39,048 |
| Panelboard: 400A, 42-circuit | 3 ea | 5,435.74 /ea | 16,307 |
| Panelboard: 400A, 84-circuit | 1 ea | 10,724.46 /ea | 10,724 |
| Distribution panel: 600A | 2 ea | 9,886.92 /ea | 19,774 |
| Distribution panel: 800A | 3 ea | 12,443.25 /ea | 37,330 |
| Transformer: floor/wall - 75kVA, 480V:208V | 1 ea | 4,384.00 /ea | 4,384 |
| K-13 Transformer: floor - 225kVA, 480V:208V | 3 ea | 12,168.50 /ea | 36,506 |
| Engineered Services - Training (Manufacturer) | 1 ea | 4,165.70 /ea | 4,166 |
| Engineered Services - Start-Up Assistance (Manufacturer) | 1 ea | 3,519.08 /ea | 3,519 |
| **Low-Voltage Distribution Equipment** | **136,600 sf** | **2.22 /sf** | **302,606** |
| **26.27.05 Low-Voltage Distribution Feeders** | | | |
| Feeder (EMT/CU) - 20A [BMS to utility meter] | 200 lf | 7.43 /lf | 1,486 |
| Feeder (EMT/CU) - 20A [EP1A to Elevator Controller] | 125 lf | 7.43 /lf | 929 |
| Feeder (EMT/CU) - 60A [MSB to SPD] | 50 lf | 14.69 /lf | 735 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.27.05 Low-Voltage Distribution Feeders** | | | |
| Feeder (EMT/CU) - 60A [2DP1A to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [2DP1B to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [2DP1C to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [4DP1B to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 90A [2DP1A to KPP1A] | 42 lf | 15.96 /lf | 670 |
| Feeder (EMT/CU) - 100A [MSB to LP1A] | 40 lf | 20.74 /lf | 830 |
| Feeder (EMT/CU) - 100A [4DP1B to LP1B] | 50 lf | 20.74 /lf | 1,037 |
| Feeder (EMT/CU) - 100A [4DP1C to LP1C] | 27 lf | 20.74 /lf | 560 |
| Feeder (EMT/CU) - 100A [4DP1B to LP2B] | 50 lf | 20.74 /lf | 1,037 |
| Feeder (EMT/CU) - 100A [2DP1A to LP2C] | 190 lf | 20.74 /lf | 3,940 |
| Feeder (EMT/CU) - 100A [4DP1B to LP3B] | 150 lf | 20.74 /lf | 3,111 |
| Feeder (EMT/CU) - 100A [4DP1C to LP3C] | 165 lf | 20.74 /lf | 3,422 |
| Feeder (EMT/CU) - 100A [MSB to LP1D] | 150 lf | 20.74 /lf | 3,111 |
| Feeder (EMT/CU) - 100A [EHP1A to Elevator Controller] | 125 lf | 20.74 /lf | 2,592 |
| Feeder (EMT/CU) - 100A [TEP1A to TEP2B] | 200 lf | 20.74 /lf | 4,148 |
| Feeder (EMT/CU) - 100A [TEP1A to TEP2C] | 200 lf | 20.74 /lf | 4,148 |
| Feeder (EMT/CU) - 100A [TEP1A to TEP1D] | 200 lf | 20.74 /lf | 4,148 |
| Feeder (EMT/CU) - 100A [TEP1A to UPS] | 50 lf | 20.74 /lf | 1,037 |
| Feeder (EMT/CU) - 100A [2DP1A to MP1A] | 410 lf | 20.74 /lf | 8,503 |
| Feeder (EMT/CU) - 125A [UPS to EP1A] | 150 lf | 20.99 /lf | 3,149 |
| Feeder (EMT/CU) - 150A [2DP1B to MP1B] | 50 lf | 26.82 /lf | 1,341 |
| Feeder (EMT/CU) - 150A [2DP1C to MSB] | 200 lf | 26.82 /lf | 5,365 |
| Feeder (EMT/CU) - 150A [2DP1C to MP3C] | 250 lf | 26.82 /lf | 6,706 |
| Feeder (EMT/CU) - 150A [2DP1B to PP2B] | 60 lf | 26.82 /lf | 1,609 |
| Feeder (EMT/CU) - 150A [2DP1C to PP2C] | 100 lf | 26.82 /lf | 2,682 |
| Feeder (EMT/CU) - 150A [2DP1B to PP1B] | 50 lf | 26.82 /lf | 1,341 |
| Feeder (EMT/CU) - 150A [2DP1C to MP1C] | 40 lf | 26.83 /lf | 1,073 |
| Feeder (EMT/CU) - 150A [2DP1C to PP2C] | 125 lf | 26.82 /lf | 3,353 |
| Feeder (EMT/CU) - 150A [2DP1C to PP3C] | 150 lf | 26.82 /lf | 4,024 |
| Feeder (EMT/CU) - 150A [4DP1C to PP3B] | 165 lf | 26.82 /lf | 4,426 |
| Feeder (EMT/CU) - 150A [2DP1C to PP1C] | 50 lf | 26.82 /lf | 1,341 |
| Feeder (EMT/CU) - 150A [2DP1A to PP1D] | 100 lf | 26.82 /lf | 2,682 |
| Feeder (EMT/CU) - 200A [MSB to ATS-LS] | 100 lf | 32.13 /lf | 3,213 |
| Feeder (EMT/CU) - 200A [ATS-LS to ELP1A] | 40 lf | 32.13 /lf | 1,285 |
| Feeder (EMT/CU) - 200A [2DP1A to PP1A] | 50 lf | 32.13 /lf | 1,607 |
| Feeder (EMT/CU) - 200A [Cam Lock Box to ATS-LS] | 60 lf | 32.13 /lf | 1,928 |
| Feeder (EMT/CU) - 225A [MSB to Dimming Rack HDP] | 250 lf | 46.72 /lf | 11,679 |
| Feeder (EMT/CU) - 225A [2DP1A to Dimming Rack SDP] | 200 lf | 46.72 /lf | 9,344 |
| Feeder (EMT/CU) - 225A [EHP1A to EHP3C] | 250 lf | 46.72 /lf | 11,679 |
| Feeder (EMT/CU) - 225A [MP3C to PP3C] | 45 lf | 46.72 /lf | 2,102 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.27.05 Low-Voltage Distribution Feeders** | | | |
| Feeder (EMT/CU) - 225A [2DP1B to MP3B] | 100 lf | 46.72 /lf | 4,672 |
| Feeder (EMT/CU) - 225A [4DP1C to MHP3C] | 165 lf | 49.70 /lf | 8,200 |
| Feeder (EMT/CU) - 225A [ATS-OS to EHP1A] | 200 lf | 49.70 /lf | 9,940 |
| Feeder (EMT/CU) - 225A [MSB to ATS-OS] | 75 lf | 49.70 /lf | 3,727 |
| Feeder (EMT/CU) - 400A [MSB to MHP1A] | 50 lf | 73.75 /lf | 3,688 |
| Feeder (EMT/CU) - 400A [EHP1C to EHP1A] | 100 lf | 73.75 /lf | 7,375 |
| Feeder (EMT/CU) - 400A [Generator to ATS-LR] (interior) | 430 lf | 73.75 /lf | 31,713 |
| Feeder (EMT/CU) - 400A [MSB to ATS-LR] | 375 lf | 78.46 /lf | 29,422 |
| Feeder (EMT/CU) - 400A [MHP-LR to ATS-LR] | 10 lf | 78.46 /lf | 785 |
| Feeder (EMT/CU) - 400A [ATS-LR to MHP-LR] | 50 lf | 73.75 /lf | 3,688 |
| Feeder (EMT/CU) - 600A [MSB to 4DP1B] | 200 lf | 108.91 /lf | 21,782 |
| Feeder (EMT/CU) - 600A [MSB to 2DP1A] | 70 lf | 108.91 /lf | 7,624 |
| Feeder (EMT/CU) - 800A [MSB to 2DP1C] | 125 lf | 138.78 /lf | 17,348 |
| Feeder (EMT/CU) - 800A [MSB to 4DP1C] | 200 lf | 138.78 /lf | 27,757 |
| Empty conduit (EMT) - 3/4" [utility meter to switchboard] | 75 lf | 6.28 /lf | 471 |
| Feeder (MC) - 125A [75kVA] | 30 lf | 12.82 /lf | 385 |
| Feeder (MC) - 225A [75kVA] | 30 lf | 35.43 /lf | 1,063 |
| Feeder (MC) - 400A [225kVA] | 90 lf | 59.32 /lf | 5,339 |
| Feeder (MC) - 800A [225kVA] | 90 lf | 111.65 /lf | 10,048 |
| M.I. Cable - 4-1/c #6 [ELP1B to ELP3B] | 150 lf | 36.15 /lf | 5,422 |
| M.I. Cable - 4-1/c #3 [EHP1A to EP3C] | 165 lf | 65.42 /lf | 10,794 |
| M.I. Cable - 4-1/c #3 [ELP1A to EDP] | 125 lf | 65.42 /lf | 8,178 |
| M.I. Cable - 4-1/c #3 [ELP1A to EP1C] | 125 lf | 65.42 /lf | 8,178 |
| M.I. Cable - 4-1/c #2 [EPL1A to ELP1B] | 150 lf | 72.60 /lf | 10,890 |
| M.I. Cable - 4-1/c #2 [ELP1A to ELP1D] | 417 lf | 77.24 /lf | 32,208 |
| Quick term kit - #6 4-1/c | 2 ea | 359.96 /ea | 720 |
| Quick term kit - #3 4-1/c | 6 ea | 710.21 /ea | 4,261 |
| Quick term kit - #2 4-1/c | 4 ea | 734.64 /ea | 2,939 |
| Brass plate (per hole) | 12 ea | 92.10 /ea | 1,105 |
| **Low-Voltage Distribution Feeders** | **136,600 sf** | **3.00 /sf** | **410,031** |
| **26.27.26 Wiring Devices** | | | |
| MC Cable (12/2) - 20A | 11,370 lf | 3.45 /lf | 39,227 |
| MC Cable (10/2) - 20A [homeruns - x372] | 24,180 lf | 4.36 /lf | 105,516 |
| EMT (12/2) - 20A | 2,000 lf | 6.70 /lf | 13,404 |
| PVC (10/2) - 20A | 450 lf | 6.68 /lf | 3,007 |
| Duplex receptacle - 20A - tamper resistant | 497 ea | 78.60 /ea | 39,065 |
| Duplex receptacle - 20A - switched with IO module | 14 ea | 67.78 /ea | 949 |
| Simplex receptacle - 20A [scoreboard control] | 2 ea | 70.18 /ea | 140 |
| Duplex receptacle - 20A - GFCI | 187 ea | 92.44 /ea | 17,286 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.27.26 Wiring Devices** | | | |
| Duplex receptacle - 20A - GFCI - W.P. | 29 ea | 129.27 /ea | 3,749 |
| Duplex receptacle - 20A [kitchen equipment] - circuitry in Equipment Wiring] | 33 ea | 67.79 /ea | 2,237 |
| Duplex receptacle - 20A [A/V] | 9 ea | 67.79 /ea | 610 |
| Duplex receptacle - 20A [CR] | 8 ea | 67.80 /ea | 542 |
| Exterior pedestal receptacle, GFI type, Wayne Tyler, Inc. #CB-BOX | 5 ea | 1,292.26 /ea | 6,461 |
| Quadruplex receptacle - 20A | 325 ea | 93.78 /ea | 30,479 |
| Quadruplex receptacle - 20A - switched with IO module | 18 ea | 93.79 /ea | 1,688 |
| Duplex receptacle - 20A - USB | 14 ea | 99.44 /ea | 1,392 |
| Specialty receptacle - 20A - L5-20R | 11 ea | 101.01 /ea | 1,111 |
| Specialty receptacle - 20A - L14-20R | 1 ea | 104.81 /ea | 105 |
| Specialty receptacle - 30A - L5-30R | 23 ea | 111.69 /ea | 2,569 |
| Quadruplex receptacle - 20A - GFCI | 5 ea | 143.12 /ea | 716 |
| Hardwired A/C junction (MC) - 20A [A/V] | 2 ea | 318.93 /ea | 638 |
| Hardwired A/C junction (MC) - 20A [fume hoods] | 4 ea | 318.93 /ea | 1,276 |
| Power junction w/feed (MC) - 20A [water coolers/bottle fillers] | 11 ea | 221.21 /ea | 2,433 |
| Power junction w/feed (MC) - 20A | 28 ea | 221.21 /ea | 6,194 |
| Trash compactor feed & connection | 2 ea | 2,243.92 /ea | 4,488 |
| Overhead door power & connection | 3 ea | 1,223.50 /ea | 3,671 |
| Dock leveler feed & connection | 1 ea | 3,532.90 /ea | 3,533 |
| Emergency power offs (EPO) | 10 ea | 295.11 /ea | 2,951 |
| Wiremold receptacles - G4 | 110 ea | 31.05 /ea | 3,416 |
| G4000 dual-channel wiremold - 24" spacing | 220 lf | 63.39 /lf | 13,945 |
| **Wiring Devices** | **136,600 sf** | **2.29 /sf** | **312,797** |
| **26.31.00 Provisions for Future Photovoltaic** | | | |
| Empty conduit - sch 40 PVC: 1 x 2" [future Canopy PV] | 280 lf | 26.88 /lf | 7,526 |
| Empty conduit - sch 40 PVC: 2 x 2" [future PV] | 1,250 lf | 35.04 /lf | 43,800 |
| Empty conduit - sch 40 PVC: 2 x 4" [future Canopy PV] | 160 lf | 45.14 /lf | 7,222 |
| **Provisions for Future Photovoltaic** | **136,600 sf** | **0.43 /sf** | **58,549** |
| **26.32.00 Packaged Generator Assemblies** | | | |
| Natural gas generator: 350kW / 437.5kVA | 1 ea | 133,322.25 /ea | 133,322 |
| Generator testing & start-up | 1 ea | 1,863.20 /ea | 1,863 |
| Generator annunciator panel | 1 ea | 1,447.40 /ea | 1,447 |
| Battery charger circuit (4#10 & 1#10G in 1"C) | 140 lf | 20.94 /lf | 2,932 |
| Jacket heater circuit | 140 lf | 34.49 /lf | 4,828 |
| Oil heater circuit | 140 lf | 53.66 /lf | 7,512 |
| Exterior W.P. sound attenuating enclosure (350kW) | 1 ea | 19,478.75 /ea | 19,479 |
| Remote status panel circuit | 140 lf | 9.64 /lf | 1,349 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.32.00 Packaged Generator Assemblies** | | | |
| Starting circuits - 2#14 MI cable | 140 lf | 12.76 /lf | 1,787 |
| Remote annunciator panel - 16#14 (EMT) | 100 lf | 15.81 /lf | 1,581 |
| Quick connect switch, ESL Storm Switch 3020 | 1 ea | 3,668.10 /ea | 3,668 |
| **Packaged Generator Assemblies** | **136,600 sf** | **1.32 /sf** | **179,769** |
| **26.33.00 Battery Equipment** | | | |
| UPS: 480-208/120V, 24kW (static ts,manual by-pass, 8min batt.BU) | 2 ea | 30,061.40 /ea | 60,123 |
| **Battery Equipment** | **136,600 sf** | **0.44 /sf** | **60,123** |
| **26.36.00 Transfer Switches** | | | |
| ATS-OS: 225A, 277/480V, 4P, no iso by-pass - open transition | 1 ea | 6,752.90 /ea | 6,753 |
| ATS-LS: 150A, 277/480V, 4P, w/ iso by-pass - open transition | 1 ea | 11,058.30 /ea | 11,058 |
| ATS-LR: 400A, 277/480V, 4P, w/ iso by-pass - open transition | 1 ea | 19,961.43 /ea | 19,961 |
| **Transfer Switches** | **136,600 sf** | **0.28 /sf** | **37,773** |
| **26.40.00 Electrical & Cathodic Protection** | | | |
| Lightning prevention system subcontractor | 1 ls | 30,000.00 /ls | 30,000 |
| **Electrical & Cathodic Protection** | **136,600 sf** | **0.22 /sf** | **30,000** |
| **26.50.00 Lighting** | | | |
| Reduce lighting by $1.50/sf - VM E01 | (136,600) sf | 1.50 /sf | (204,900) |
| LK24: 2'x2' lay-in fixture [O] | 24 ea | 198.57 /ea | 4,766 |
| SPFL: LED flood light [C] | 20 ea | 682.90 /ea | 13,658 |
| SPNF: LED flood light, narrow [C] | 20 ea | 682.90 /ea | 13,658 |
| LR2 (emerg): 2' linear 2" aperature recessed luminaire [O] | 183 ea | 300.48 /ea | 54,987 |
| LR2: 2' linear 2" aperature recessed luminaire [O] | 912 ea | 300.48 /ea | 274,033 |
| G4: 4' linear rugged low profile 360 deg adjustable flood luminaire [O] | 80 ea | 1,160.93 /ea | 92,874 |
| LS4: 4' utility fixtre with frosted acrylic diffuser [O] | 20 ea | 246.16 /ea | 4,923 |
| LS4 (emerg): 4' utility fixture with frosted acrylic diffuser [O] | 14 ea | 246.16 /ea | 3,446 |
| LS8: 8' utility fixtre with frosted acrylic diffuser [O] | 11 ea | 411.94 /ea | 4,531 |
| LS4A (emerg): 4' utility fixtre with frosted acrylic diffuser [O] | 12 ea | 494.94 /ea | 5,939 |
| LS4A: 4' utility fixture with frosted acrylic diffuser [O] | 12 ea | 494.94 /ea | 5,939 |
| LP8 (emerg): Axis 8' LED fixture [O] | 9 ea | 1,027.94 /ea | 9,251 |
| LS8 (emerg): 8' utility fixture with frosted acrylic diffuser [O] | 10 ea | 411.94 /ea | 4,119 |
| JB: utility fixture with frosted tempered glass globe & guard [O] | 4 ea | 245.95 /ea | 984 |
| PC3: 6" down light fixture with dead-front gasketed trim [O] | 1 ea | 298.16 /ea | 298 |
| LRW (emerg): 6" aperature LED linear recessed fixture / qty. of 18 [C] | 114 lf | 146.99 /lf | 16,757 |
| PC1: 4" down light fixture, 0-10V dimming capable [O] | 24 ea | 298.16 /ea | 7,156 |
| RC1: 6" down light fixture [O] | 45 ea | 271.54 /ea | 12,219 |
| RC1 (emerg): 6" down light fixture [O] | 18 ea | 271.54 /ea | 4,888 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.50.00 Lighting** | | | |
| LS2 (emerg): 2' utility fixture [O] | 2 ea | 177.98 /ea | 356 |
| LSV4: 4' linear utility fixture with prismatic polcarbonate lens [C] | 4 ea | 675.93 /ea | 2,704 |
| RC2: 4" down light fixture, 0-10V dimming [O] | 8 ea | 230.56 /ea | 1,844 |
| LR4: 4' linear 2" aperature recessed luminaire with frosted lens [O] | 1 ea | 410.45 /ea | 410 |
| LUL: LED tape light with AL channel [C] | 1,840 lf | 88.49 /lf | 162,829 |
| LC3: linear cove Xeleum lighting / qty. of 96 [O] | 1,925 lf | 121.99 /lf | 234,826 |
| LWW: LED tape light with AL channel [C] | 1,408 lf | 88.49 /lf | 124,599 |
| RSH: 6" down light fixture with dead-front gasketed trim [O] | 1 ea | 306.54 /ea | 307 |
| LC2: linear cove fixture with frosted diffuser / qty. of 10 [O] | 76 lf | 148.23 /lf | 11,265 |
| PC2: 6" down light fixture with dead-front gasketed trim [O] | 28 ea | 298.16 /ea | 8,348 |
| LCL: LED tape light with AL channel [C] | 3,051 lf | 88.49 /lf | 269,994 |
| LSL: LED strip mounted on edge of stage / qty. of 1 | 59 lf | 305.95 /lf | 18,051 |
| Exit sign, ceiling mounted, double sided [O] | 34 ea | 196.16 /ea | 6,669 |
| Exit sign, ceiling mounted, single sided [O] | 16 ea | 183.16 /ea | 2,931 |
| Exit sign, wall mounted | 18 ea | 313.16 /ea | 5,637 |
| Exit sign, ceiling mounted, single sided - handicap [O] | 2 ea | 433.16 /ea | 866 |
| LRC (emerg): 6" aperature LED linear recessed fixture / qty. of 46 [C] | 596 lf | 161.70 /lf | 96,373 |
| Revised lighting package from Omni-Lite | (1) ls | 271,965.00 /ls | (271,965) |
| MC Cable (12/2) - 20A (concealed branch) | 12,068 lf | 3.67 /lf | 44,291 |
| MC Cable (10/2) - 20A (concealed homeruns) | 2,400 lf | 4.64 /lf | 11,142 |
| EMT (12/2) - 20A (exposed branch) | 4,023 lf | 7.13 /lf | 28,679 |
| EMT (10/2) - 20A (exposed homeruns) | 500 lf | 8.58 /lf | 4,290 |
| **Lighting** | **136,600 sf** | **8.01 /sf** | **1,093,973** |
| **26.56.00 Exterior Lighting** | | | |
| SL4: LED egress / perimeter lighting fixture - custom color/finish [O] | 20 ea | 565.36 /ea | 11,307 |
| SL5: exterior ampitheater RGB projector, DMX capable, IP65 rated [O] | 8 ea | 3,626.85 /ea | 29,015 |
| SLS: LED recessed step light, 0-10V dimming capable [C] | 7 ea | 732.90 /ea | 5,130 |
| SL1: LED pole mounted luminaires mounted on a 20' pole [O] | 35 ea | 2,891.40 /ea | 101,199 |
| SL2A: exterior post top fixture with 15' round tapered alum pole [O] | 13 ea | 5,492.50 /ea | 71,403 |
| SL3: exterior bollard 43.3 cast illuminum [O] | 9 ea | 1,929.78 /ea | 17,368 |
| SL10: LED mini in-ground flood fixture capable of 0-10V dimming [O] | 12 ea | 978.60 /ea | 11,743 |
| MC Cable (12/2) - 20A | 1,200 lf | 3.67 /lf | 4,404 |
| EMT (12/2) - 20A | 1,400 lf | 7.13 /lf | 9,981 |
| 1" PVC - 30A (3#8 & #10G) | 6,900 lf | 10.95 /lf | 75,528 |
| 1" GRC - 90 Deg Sweep | 114 ea | 174.22 /ea | 19,861 |
| **Exterior Lighting** | **136,600 sf** | **2.61 /sf** | **356,940** |
| **27.00.01 Data/Voice/Audio-Video Communications** | | | |
| Tel/data J-hook system (plenum) | 136,600 sf | 0.19 /sf | 25,681 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **27.00.01 Data/Voice/Audio-Video Communications** | | | |
| Cable tray - 18"W (IDF/MDF only) | 200 lf | 75.55 /lf | 15,109 |
| Empty conduit (PVC) - 1" | 250 lf | 8.07 /lf | 2,016 |
| Empty conduit (EMT) - 2" | 650 lf | 11.19 /lf | 7,271 |
| Empty conduit (PVC) - 2" | 700 lf | 6.03 /lf | 4,223 |
| Empty conduit (sch 40 PVC) (4) 4"C (CATV, Telephone, FIber, Spare) | 220 lf | 32.32 /lf | 7,110 |
| Three (3) 1.25" inner ducts for fiber | 220 lf | 15.50 /lf | 3,411 |
| Communications utility pole conduit riser (GRC - 4"C) | 4 ea | 2,343.84 /ea | 9,375 |
| Copper ground bar w/isolators - 2"x1/4" | 4 ea | 280.03 /ea | 1,120 |
| Conduit sleeve w/ fireproofing - 4" | 20 ea | 201.11 /ea | 4,022 |
| Data outlet - (1) CAT-6A cable | 20 ea | 264.84 /ea | 5,297 |
| Data outlet - (1) CAT-6A cable [audio-visual] | 12 ea | 264.84 /ea | 3,178 |
| Data outlet - (2) CAT-6A cables | 131 ea | 466.16 /ea | 61,067 |
| Tel/data outlet - (3) CAT-6A cables | 91 ea | 652.82 /ea | 59,407 |
| Floor box tel/data outlet - (3) CAT-6A cables | 2 ea | 652.83 /ea | 1,306 |
| Voice outlet - (1) CAT-6A cable (WAP's by Owner) | 79 ea | 263.70 /ea | 20,832 |
| Wireless access point - (1) CAT-6A cable (WAP's by Owner) | 138 ea | 263.70 /ea | 36,390 |
| TVE - Video outlet | 56 ea | 838.75 /ea | 46,970 |
| TVC - Video outlet | 2 ea | 838.77 /ea | 1,678 |
| Double gang junction box with (4) 1" C | 54 ea | 482.68 /ea | 26,065 |
| FO - 12 strand SM | 1,750 lf | 5.27 /lf | 9,225 |
| FO - 12 strand MM | 1,500 lf | 7.10 /lf | 10,642 |
| 4-Post Full Height Rack | 10 ea | 1,170.17 /ea | 11,702 |
| Vertical cable wire manager | 20 ea | 314.09 /ea | 6,282 |
| Horizontal cable wire manager | 10 ea | 80.25 /ea | 803 |
| Copper patch panel - 96 port | 15 ea | 1,244.28 /ea | 18,664 |
| Fiber optic patch panel - 24 port | 6 ea | 570.06 /ea | 3,420 |
| Fiber enclosure (rack mtd.) | 6 ea | 485.85 /ea | 2,915 |
| Network switch - 24 port | 2 ea | 5,390.24 /ea | 10,780 |
| Telecom manhole & cover - 4'x6'x7' | 1 ea | 3,920.36 /ea | 3,920 |
| **Data/Voice/Audio-Video Communications** | **136,600 sf** | **3.07 /sf** | **419,882** |
| **27.40.00 Audio-Video Communications** | | | |
| S1: wall mounted loudspeaker - 1 gang metal box w/ cover | 2 ea | 228.33 /ea | 457 |
| S2: ceiling loud speaker - custom backbox | 6 ea | 308.23 /ea | 1,849 |
| S3: ceiling loud speaker - 4" SQ metal box w/ cover | 16 ea | 179.94 /ea | 2,879 |
| S4: ceiling loud speaker - 4" SQ metal box w/ cover | 2 ea | 251.94 /ea | 504 |
| S5: ceiling loud speaker - 4" SQ metal box w/ cover (New) | 2 ea | 245.27 /ea | 491 |
| D1: display back box, Chief PAC-526 | 3 ea | 371.35 /ea | 1,114 |
| F1: floor box, FSR FL-500P-6 floor box w/ finished cover | 1 ea | 469.58 /ea | 470 |
| V1: wall mounted video projector - 1 gang metal box w/ cover | 1 ea | 179.47 /ea | 179 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **27.40.00 Audio-Video Communications** | | | |
| R1: receptacle panel - 2 gang metal box w/ cover | 3 ea | 242.43 /ea | 727 |
| R2: receptacle panel - 12"x12"x4" NEMA-1 enclosure w/ oversized flush | 2 ea | 242.43 /ea | 485 |
| R3: receptacle panel - 3 gang metal box w/ cover | 4 ea | 311.69 /ea | 1,247 |
| R5: receptacle panel - 3 gang metal box w/ cover | 1 ea | 242.43 /ea | 242 |
| R6: receptacle panel - 12"x12"x4" NEMA-1 enclosure w/ oversized flush | 2 ea | 405.94 /ea | 812 |
| BP: wall mounted button panel - 1 gang metal box w/ cover | 3 ea | 221.77 /ea | 665 |
| J1: junction box - type 1 - 12"x12"x4" NEMA-1 enclosure w/ oversized flush | 2 ea | 723.57 /ea | 1,447 |
| J2: junction box - type 2 - 18"x18"x4" NEMA-1 enclosure w/ oversized flush | 1 ea | 844.78 /ea | 845 |
| J3: junction box - type 3 - same as Type 2 | 3 ea | 844.78 /ea | 2,534 |
| A1: Wall mounted antenna - 1 gang deep metal box w/ cover | 2 ea | 159.74 /ea | 319 |
| A2: Wall mounted antenna - 1 gang deep metal box w/ cover | 1 ea | 159.74 /ea | 160 |
| A3: Ceiling mounted antenna - 4" SQ metal box w/ cover | 2 ea | 138.32 /ea | 277 |
| A4: Ceiling mounted antenna - 4" SQ metal box w/ cover | 1 ea | 138.31 /ea | 138 |
| PS: Production communication speaker station - 4 gang deep metal box w/ cov | 5 ea | 385.28 /ea | 1,926 |
| PC: Production communication - 1 gang deep metal box w/ cover | 1 ea | 134.38 /ea | 134 |
| T1: Wall mounted touch panel - 3 gang metal box w/ cover | 2 ea | 249.04 /ea | 498 |
| VC: Wall mounted audio volume control - 1 gang deep metal box | 2 ea | 134.39 /ea | 269 |
| MC: Motor controller - 4" SQ metal box w/ cover | 3 ea | 86.46 /ea | 259 |
| C1: Wall mounted camera - 2 gang deep metal box w/ cover | 1 ea | 193.57 /ea | 194 |
| A/V Equipment Rack | 2 ea | 1,001.85 /ea | 2,004 |
| M1: Ceiling mounted microphone - 1 gang deep metal box w/ cover | 1 ea | 134.38 /ea | 134 |
| **Audio-Video Communications** | **136,600 sf** | **0.17 /sf** | **23,260** |
| **27.50.00 Distributed Communications & Monitoring Systems** | | | |
| Intercom sub-stations | 6 ea | 1,009.28 /ea | 6,056 |
| Intercom master-stations | 5 ea | 3,327.13 /ea | 16,636 |
| **Distributed Communications & Monitoring Systems** | **136,600 sf** | **0.17 /sf** | **22,691** |
| **27.51.19 Ceiling Speaker System** | | | |
| Speaker - ceiling mouted | 269 ea | 405.93 /ea | 109,194 |
| Speaker - wall mounted | 32 ea | 611.85 /ea | 19,579 |
| Volume control | 24 ea | 177.96 /ea | 4,271 |
| Power supply (80) units - speakers 24V DC | 4 ea | 2,661.71 /ea | 10,647 |
| PA console | 1 ea | 14,251.90 /ea | 14,252 |
| PA equipment power connection - 120V | 1 ea | 256.53 /ea | 257 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **27.51.19 Ceiling Speaker System** | | | |
| AM/FM/CD/DVD tuner | 1 ea | 694.40 /ea | 694 |
| Speaker system testing | 1 ea | 1,986.71 /ea | 1,987 |
| **Ceiling Speaker System** | **136,600 sf** | **1.18 /sf** | **160,880** |
| **27.51.29 Emergency Communications Systems** | | | |
| Two way communication call box (recessed) | 20 ea | 799.75 /ea | 15,995 |
| Power supply w/battery back up | 1 ea | 1,714.28 /ea | 1,714 |
| Two way communication base station (28 zone) | 1 ea | 5,980.66 /ea | 5,981 |
| Power junction w/feed (EMT) - 20A | 1 ea | 337.91 /ea | 338 |
| Tel/data outlet - (1) CAT-6A cable | 20 ea | 264.84 /ea | 5,297 |
| Tel/data outlet - (2) CAT-6A cables | 1 ea | 466.16 /ea | 466 |
| Empty conduit (EMT) - 3/4" | 2,000 lf | 5.11 /lf | 10,218 |
| System testing | 1 ea | 1,016.70 /ea | 1,017 |
| **Emergency Communications Systems** | **136,600 sf** | **0.30 /sf** | **41,026** |
| **27.53.00 Clock System** | | | |
| Clock, wall mounted - 12" round | 126 ea | 283.06 /ea | 35,665 |
| Master clock w/ roof mounted antenna | 1 ea | 3,778.57 /ea | 3,779 |
| Wireless clock repeater | 1 ea | 647.06 /ea | 647 |
| Wireless clock transciever | 1 ea | 647.06 /ea | 647 |
| Program unit | 1 ea | 991.96 /ea | 992 |
| Speaker baffle, clock back box | 74 ea | 202.78 /ea | 15,006 |
| Wire guard | 20 ea | 57.70 /ea | 1,154 |
| Clock wiring (EMT) | 700 lf | 7.03 /lf | 4,923 |
| Clock wiring (RS-485 plenum) | 500 lf | 3.08 /lf | 1,540 |
| System testing | 1 ls | 33.83 /ls | 34 |
| **Clock System** | **136,600 sf** | **0.47 /sf** | **64,387** |
| **28.10.00 Electronic Access Control & Intrusion Detection** | | | |
| Card readers | 22 ea | 1,163.83 /ea | 25,604 |
| Card readers - W.P. | 3 ea | 1,967.78 /ea | 5,903 |
| Electro-magnetic lock | 6 ea | 657.91 /ea | 3,947 |
| Request to exit motion sensor | 26 ea | 322.33 /ea | 8,380 |
| Electric strike | 40 ea | 400.49 /ea | 16,020 |
| Thermal disconnecting means | 20 ea | 427.58 /ea | 8,552 |
| 24V power supply | 20 ea | 295.11 /ea | 5,902 |
| Junction box - 6"x6"x4" | 20 ea | 130.61 /ea | 2,612 |
| Power transfer hinge | 20 ea | 377.68 /ea | 7,554 |
| Intrusion digital keypads | 4 ea | 984.97 /ea | 3,940 |
| Dual tech motion detectors | 77 ea | 595.80 /ea | 45,876 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **28.10.00 Electronic Access Control & Intrusion Detection** | | | |
| Door contacts | 63 ea | 465.74 /ea | 29,342 |
| Access control panel | 1 ea | 8,222.56 /ea | 8,223 |
| Tie in to lighting control system | 1 ea | 402.23 /ea | 402 |
| Security wiring - cable | 7,500 lf | 3.80 /lf | 28,527 |
| Security wiring (EMT) | 2,250 lf | 8.53 /lf | 19,181 |
| Power junctions - 120V/20A | 2 ea | 193.20 /ea | 386 |
| Connect to CCTV system | 1 ea | 665.43 /ea | 665 |
| Proximity cards | 250 ea | 2.35 /ea | 588 |
| Software / licenses, programming, testing, startup (manufacturer) | 1 ea | 13,308.52 /ea | 13,309 |
| **Electronic Access Control & Intrusion Detection** | **136,600 sf** | **1.72 /sf** | **234,913** |
| **28.20.00 Video Surveillance** | | | |
| CCTV color monitors | 2 ea | 815.52 /ea | 1,631 |
| 360-degree multi-sensor interior cameras | 28 ea | 1,659.85 /ea | 46,476 |
| Dome I.P. camera - exterior | 19 ea | 1,996.28 /ea | 37,929 |
| Dome I.P. camera - interior - fixed | 27 ea | 1,471.85 /ea | 39,740 |
| 360-degree multi-sensor exterior cameras mounted on poles | 3 ea | 4,509.56 /ea | 13,529 |
| Camera monitoring station | 1 ea | 1,330.85 /ea | 1,331 |
| Video recorders | 2 ea | 3,131.71 /ea | 6,263 |
| Video switchers | 2 ea | 1,627.71 /ea | 3,255 |
| Camera wiring (EMT) | 2,500 lf | 8.76 /lf | 21,899 |
| Camera wiring (PVC) | 600 lf | 13.34 /lf | 8,003 |
| Camera wiring - cable | 7,400 lf | 4.04 /lf | 29,885 |
| Power junction - 120V/20A | 2 ea | 193.20 /ea | 386 |
| Software / licenses, programming, testing, startup (manufacturer) | 1 ea | 13,308.52 /ea | 13,309 |
| **Video Surveillance** | **136,600 sf** | **1.64 /sf** | **223,638** |
| **28.46.00 Temporary Fire Alarm** | | | |
| ***Temporary fire alarm heat detection coverage / stairwell pull stations / temp notification - N/A*** | - | /- | |
| Fire alarm impairment plan (NFPA-101) | 1 ls | 10,000.00 /ls | 10,000 |
| **Temporary Fire Alarm** | **136,600 sf** | **0.07 /sf** | **10,000** |
| **28.46.20 Fire Detection and Alarm** | | | |
| Elevator fire alarm interfacing | 1 ls | 5,000.00 /ls | 5,000 |
| Manual pull stations | 25 ea | 202.12 /ea | 5,053 |
| Mass notification | 1 ls | 49,999.98 /ls | 50,000 |
| Smoke detectors | 82 ea | 220.39 /ea | 18,072 |
| Smoke detector w/ elevator recall | 3 ea | 373.26 /ea | 1,120 |
| Smoke detectors (for Atrium) | 89 ea | 220.39 /ea | 19,615 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **28.46.20 Fire Detection and Alarm** | | | |
| Smoke detectors w/ elevator recall (for Atrium) | 3 ea | 373.25 /ea | 1,120 |
| Carbon monoxide detector (w/ monitor module) | 5 ea | 367.16 /ea | 1,836 |
| Beam detector (receiver & transmitter) | 5 ea | 416.88 /ea | 2,084 |
| Duct smoke detector (furnish & wire) | 40 ea | 838.91 /ea | 33,556 |
| Remote test switch w/ indicating light | 40 ea | 194.88 /ea | 7,795 |
| Control modules | 20 ea | 265.75 /ea | 5,315 |
| Addressable monitor modules | 30 ea | 160.83 /ea | 4,825 |
| Tamper switch connection (via monitor module) | 8 ea | 560.06 /ea | 4,480 |
| Flow switch connection (via monitor module) | 8 ea | 403.67 /ea | 3,229 |
| Door hold device (magnetic) | 5 ea | 388.88 /ea | 1,944 |
| Wire motorized dampers (120V) | 14 ea | 407.48 /ea | 5,705 |
| Wire combination fire/smoke damper (120V & SLC) | 20 ea | 608.50 /ea | 12,170 |
| Strobe only | 48 ea | 175.36 /ea | 8,417 |
| Speaker/strobes | 150 ea | 246.56 /ea | 36,983 |
| Speaker/strobe - W.P. | 1 ea | 309.72 /ea | 310 |
| Horn/visual - wall mounted | 52 ea | 222.79 /ea | 11,585 |
| Exterior beacons (weatherproof) | 4 ea | 388.83 /ea | 1,555 |
| Fire alarm transponder panels | 6 ea | 928.51 /ea | 5,571 |
| Fire alarm annunciators w/ microphones | 3 ea | 2,107.39 /ea | 6,322 |
| FACP w/ 60-minute battery backup (Notifier NFS640) | 1 ea | 6,999.66 /ea | 7,000 |
| Masterbox (local energy) | 1 ea | 4,212.70 /ea | 4,213 |
| Key (Knox) box | 2 ea | 806.43 /ea | 1,613 |
| Smoke control panel | 1 ea | 19,502.56 /ea | 19,503 |
| Generator monitoring control panel | 1 ea | 571.80 /ea | 572 |
| Fire pump/jockey pump connection | 1 ea | 402.23 /ea | 402 |
| Fire alarm graphic maps | 3 ea | 1,454.56 /ea | 4,364 |
| Fire alarm comissioning | 1 ea | 6,158.00 /ea | 6,158 |
| Fire alarm testing (manufacturer) | 6 ea | 1,338.28 /ea | 8,030 |
| Fire alarm system programming | 397 ea | 20.79 /ea | 8,254 |
| FPLP cable (red) - #14-4/c | 11,475 lf | 2.23 /lf | 25,589 |
| FPLP cable (red) - #16-2/c | 12,330 lf | 1.83 /lf | 22,564 |
| EMT (red) - 3/4"C w/ #16-2/c (exposed) | 2,500 lf | 7.19 /lf | 17,981 |
| EMT (red) - 3/4"C w/ #14-4/c (exposed) | 1,200 lf | 7.95 /lf | 9,535 |
| Circuit integrity cabling (CIC) | 1,500 lf | 18.31 /lf | 27,465 |
| Ductbank w/ IMSA cable - 2" PVC | 320 lf | 16.30 /lf | 5,217 |
| **Fire Detection and Alarm** | **136,600 sf** | **3.09 /sf** | **422,120** |
| **28.46.24 Distributed Antenna System (DAS)** | | | |
| BDA system - parts & smarts (dual-frequency) | 136,600 sf | 0.47 /sf | 64,202 |
| BDA system - installation & minor material (dual-frequency) | 136,600 sf | 0.19 /sf | 25,681 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **28.46.24 Distributed Antenna System (DAS)** | | | |
| Directional couplers | 20 ea | 1,150.35 /ea | 23,007 |
| In-Line connectors | 20 ea | 249.01 /ea | 4,980 |
| Lightning protection units | 5 ea | 1,995.53 /ea | 9,978 |
| **Distributed Antenna System (DAS)** | **136,600 sf** | **0.94 /sf** | **127,848** |
| **26-01 ELECTRICAL (TS)** | **136,600 sf** | **42.27 /sf** | **5,773,794** |
| **31-23 SITEWORK** | | | |
| **02.41.13 Demolition - Site** | | | |
| ***Demo hydrants*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo bituminous concrete paving*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo bituminous walk*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo Temporary Bituminous Parking & Access Pavement*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo concrete sidewalks/pads/ramps*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo curbing*** | ***BP#1*** | ***/BP#1*** | |
| ***Cut & cap site utilities - water*** | ***BP#1*** | ***/BP#1*** | |
| ***Cut & cap site utilities - sewer*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo utility piping - water*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo utility piping - sewer*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo utility piping - electrical*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo utility piping - drain*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo utility piping - gas*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo drain structures*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo grease trap*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo fencing/guardrail*** | ***BP#1*** | ***/BP#1*** | |
| ***Misc. site demolition*** | ***BP#1*** | ***/BP#1*** | |
| ***Demo utility poles*** | ***BP#1*** | ***/BP#1*** | |
| **Demolition - Site** | **136,600 sf** | **/sf** | |
| **31.00.05 General Requirements** | | | |
| ***Mobilizations*** | ***BP#1*** | ***/BP#1*** | |
| ***Survey/layout*** | ***BP#1*** | ***/BP#1*** | |
| ***Preconstruction survey and vibration monitoring & compliance*** | ***BP#1*** | ***/BP#1*** | |
| ***Street plates for protection*** | ***BP#1*** | ***/BP#1*** | |
| ***Police details*** | ***BP#1*** | ***/BP#1*** | |
| ***Precast Concrete Jersey Barriers for Temp. Parking Lot*** | ***BP#1*** | ***/BP#1*** | |
| ***Temporary site signage*** | ***BP#1*** | ***/BP#1*** | |
| ***As-built plan preparation*** | ***BP#1*** | ***/BP#1*** | |
| ***Localized dewatering*** | ***BP#1*** | ***/BP#1*** | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **General Requirements** | **136,600 sf** | **/sf** | |
| **31.10.00 Site Clearing** | | | |
| ***Clear & grub, vegetation removal*** | ***BP#1*** | ***/BP#1*** | |
| ***Strip & stockpile topsoil/loam*** | ***BP#1*** | ***/BP#1*** | |
| **Site Clearing** | **136,600 sf** | **/sf** | |
| **31.22.00 Grading** | | | |
| ***Rough grading*** | ***BP#1*** | ***/BP#1*** | |
| ***Fine grading - building SOG*** | ***BP#1*** | ***/BP#1*** | |
| ***Fine grading - paving*** | ***BP#1*** | ***/BP#1*** | |
| ***Fine grading - conc walks & site pads*** | ***BP#1*** | ***/BP#1*** | |
| ***Fine grading - bituminous walks*** | ***BP#1*** | ***/BP#1*** | |
| **Grading** | **136,600 sf** | **/sf** | |
| **31.23.00 Excavation & Fill - Overall Site** | | | |
| ***Cut to subgrade @ site*** | ***BP#1*** | ***/BP#1*** | |
| ***Fill to subgrade from cut @ site*** | ***BP#1*** | ***/BP#1*** | |
| ***Grind foundations for fill - In Demolition*** | ***-*** | ***/-*** | |
| ***Fill to subgrade @ site - import*** | ***BP#1*** | ***/BP#1*** | |
| ***Site cuts to stockpile for temporary parking & access layout*** | ***BP#1*** | ***/BP#1*** | |
| ***Site surcharge*** | ***BP#1*** | ***/BP#1*** | |
| ***Site cuts to site fills*** | ***BP#1*** | ***/BP#1*** | |
| ***Excavation @ foundations*** | ***BP#1*** | ***/BP#1*** | |
| ***Fill to subgrade @ building footprint - import (structural fill)*** | ***BP#1*** | ***/BP#1*** | |
| ***Contaminated soil removal - unlined landfill*** | ***BP#1*** | ***/BP#1*** | |
| ***Crushed stone base beneath S.O.G*** | ***BP#1*** | ***/BP#1*** | |
| ***Crushed stone base beneath column & wall footings*** | ***BP#1*** | ***/BP#1*** | |
| **Excavation & Fill - Overall Site** | **136,600 sf** | **/sf** | |
| **31.23.01 Excavation & Fill - Foundations** | | | |
| ***Excavate for elevator pits*** | ***BP#1*** | ***/BP#1*** | |
| ***Fine grade under building*** | ***BP#1*** | ***/BP#1*** | |
| **Excavation & Fill - Foundations** | **136,600 sf** | **/sf** | |
| **31.23.02 Excavation & Fill - Utilities** | | | |
| ***Excavate/backfill utilities under SOG by machine*** | ***BP#1*** | ***/BP#1*** | |
| **Excavation & Fill - Utilities** | **136,600 sf** | **/sf** | |
| **31.23.16 Rock Removal** | | | |
| ***Rock removal - NIC*** | ***-*** | ***/-*** | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Rock Removal** | **136,600 sf** | **/sf** | |
| **31.23.19 Dewatering** | | | |
| ***Dewatering*** | ***BP#1*** | ***/BP#1*** | |
| ***Construct Phase 2 Temp. Sediment Basins*** | ***BP#1*** | ***/BP#1*** | |
| ***Additional dewatering*** | ***BP#1*** | ***/BP#1*** | |
| **Dewatering** | **136,600 sf** | **/sf** | |
| **31.25.00 Erosion & Sedimentation Control** | | | |
| ***SWPPP (Prep of SWPPP by civil engineer)*** | ***BP#1*** | ***/BP#1*** | |
| ***12"diameter Straw Wattles*** | ***BP#1*** | ***/BP#1*** | |
| ***Silt sacks at catch basin*** | ***BP#1*** | ***/BP#1*** | |
| ***Construction entrance*** | ***BP#1*** | ***/BP#1*** | |
| ***Street sweeping*** | ***BP#1*** | ***/BP#1*** | |
| ***Inspect / repair silt barrier weekly*** | ***BP#1*** | ***/BP#1*** | |
| ***Remove erosion control measure at project completion*** | ***BP#1*** | ***/BP#1*** | |
| **Erosion & Sedimentation Control** | **136,600 sf** | **/sf** | |
| **31.62.00 Ground Improvement** | | | |
| ***Site surcharge/rigid inclusion*** | ***BP#1*** | ***/BP#1*** | |
| ***Rammed aggregate piers*** | ***BP#1*** | ***/BP#1*** | |
| ***Rigid inclusions Gym and Auditorium*** | ***BP#1*** | ***/BP#1*** | |
| **Ground Improvement** | **136,600 sf** | **/sf** | |
| **32.11.00 Base Courses** | | | |
| ***Gravel base course @ asphalt pavements*** | ***BP#1*** | ***/BP#1*** | |
| ***Gravel base course @ Raised Stamped asphalt pavement at Flagg Drive*** | ***BP#1*** | ***/BP#1*** | |
| ***Processed Aggregate base course - bituminous walks*** | ***BP#1*** | ***/BP#1*** | |
| ***1 1/2" crushed stone base course - concrete walks & site pads*** | ***BP#1*** | ***/BP#1*** | |
| ***Gravel base course - misc site amenities- (i.e.- curbing, swales,etc.)*** | ***BP#1*** | ***/BP#1*** | |
| **Base Courses** | **136,600 sf** | **/sf** | |
| **32.12.00 Flexible Paving** | | | |
| ***Asphalt paving - (Parking Lots & Site Drives)*** | ***BP#1*** | ***/BP#1*** | |
| ***Asphalt paving - Temp. Parking Layout*** | ***BP#1*** | ***/BP#1*** | |
| ***Temporary roads and maintenance required during construction*** | ***BP#1*** | ***/BP#1*** | |
| ***Asphalt paving - top course @ temporary to permanent*** | ***BP#1*** | ***/BP#1*** | |
| **Flexible Paving** | **136,600 sf** | **/sf** | |
| **32.13.00 Rigid Paving** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **32.13.00 Rigid Paving** | | | |
| *Stamped pavement at Flagg Drive* | BP#1 | /BP#1 | |
| Rigid Paving | 136,600 sf | /sf | |
| **32.16.13 Curbs & Gutters** | | | |
| *Precast concrete curbs* | BP#1 | /BP#1 | |
| *Vertical granite curbs* | BP#1 | /BP#1 | |
| *Handicapped ramps at curbing* | BP#1 | /BP#1 | |
| *Detectable Warning Plates at Handicapped Ramps* | BP#1 | /BP#1 | |
| Curbs & Gutters | 136,600 sf | /sf | |
| **32.16.23 Sidewalks** | | | |
| *Bituminous sidewalks* | BP#1 | /BP#1 | |
| Sidewalks | 136,600 sf | /sf | |
| **32.17.00 Paving Specialties** | | | |
| *Speed bumps - bituminous* | BP#1 | /BP#1 | |
| *Pavement markings* | BP#1 | /BP#1 | |
| *Parking signage* | BP#1 | /BP#1 | |
| Paving Specialties | 136,600 sf | /sf | |
| **33.10.00 Water Utilities** | | | |
| *Fire hydrants* | BP#1 | /BP#1 | |
| *Fire hydrant - relocate existing* | BP#1 | /BP#1 | |
| *Gate valves, tees, bends, thrust blocks, restraints* | BP#1 | /BP#1 | |
| *Water distribution  connections to existing* | BP#1 | /BP#1 | |
| *Water line - domestic* | BP#1 | /BP#1 | |
| *Water line - hydrant & fire services* | BP#1 | /BP#1 | |
| *Pressure test & chlorinate* | BP#1 | /BP#1 | |
| Water Utilities | 136,600 sf | /sf | |
| **33.30.00 Sanitary Sewerage Utilities** | | | |
| *Sanitary sewer piping* | BP#1 | /BP#1 | |
| *Sanitary sewer manholes* | BP#1 | /BP#1 | |
| *Connect to existing structures* | BP#1 | /BP#1 | |
| *Utility and sewer tie-in at trailer* | BP#1 | /BP#1 | |
| *Sanitary sewer testing - piping* | BP#1 | /BP#1 | |
| *Video inspect incoming sewer, etc.* | BP#1 | /BP#1 | |
| *Sanitary sewer testing - structures* | BP#1 | /BP#1 | |
| Sanitary Sewerage Utilities | 136,600 sf | /sf | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **33.36.00 Utility Septic Tanks** | | | |
| *Grease interceptor - In Plumbing* | - | /- | |
| *Acid Neutralization - In Plumbing* | - | /- | |
| **Utility Septic Tanks** | **136,600 sf** | **/sf** | |
| **33.40.00 Storm Drainage Utilities** | | | |
| *Catch basins* | *BP#1* | */BP#1* | |
| *Granite Curb Inlets* | *BP#1* | */BP#1* | |
| *Storm drainage manholes* | *BP#1* | */BP#1* | |
| *Outlet control structures* | *BP#1* | */BP#1* | |
| *Storm headwalls* | *BP#1* | */BP#1* | |
| *Stormceptors* | *BP#1* | */BP#1* | |
| *Storm drainage piping* | *BP#1* | */BP#1* | |
| *Rip Rap Splash Pads* | *BP#1* | */BP#1* | |
| *Weir Overflows* | *BP#1* | */BP#1* | |
| *Check dams* | *BP#1* | */BP#1* | |
| **Storm Drainage Utilities** | **136,600 sf** | **/sf** | |
| **33.46.00 Subdrainage** | | | |
| *Foundation drainage piping* | *BP#1* | */BP#1* | |
| **Subdrainage** | **136,600 sf** | **/sf** | |
| **33.47.00 Infiltration Systems** | | | |
| *Infiltration system* | *BP#1* | */BP#1* | |
| **Infiltration Systems** | **136,600 sf** | **/sf** | |
| **33.50.00 Fuel Distribution Utilities** | | | |
| *Excavation / backfill for gas line* | *BP#1* | */BP#1* | |
| **Fuel Distribution Utilities** | **136,600 sf** | **/sf** | |
| **33.70.00 Electrical Utilities** | | | |
| *Excavation/backfill for Emergency Generator ductbank* | *BP#1* | */BP#1* | |
| *Excavation/backfill for Primary Electric ductbank* | *BP#1* | */BP#1* | |
| *Excavation/backfill for Fire Alarm ductbank* | *BP#1* | */BP#1* | |
| *Excavation/backfill for Telcom ductbank* | *BP#1* | */BP#1* | |
| *Excavation/backfill for U.G. ductbank* | *BP#1* | */BP#1* | |
| *Excavation/backfill for 2"C Power Data ductbank (Amphitheather)* | *BP#1* | */BP#1* | |
| *Excavation/backfill for 2"C to IDF ductbank* | *BP#1* | */BP#1* | |
| *Concrete and rebar for electrical/telcom ductbanks* | *BP#1* | */BP#1* | |
| *Excavation/backfill for site lighting* | *BP#1* | */BP#1* | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **33.70.00 Electrical Utilities** | | | |
| ***Emergency Call Box base*** | ***BP#1*** | ***/BP#1*** | |
| ***EV Parking Station bases*** | ***BP#1*** | ***/BP#1*** | |
| ***Light pole bases*** | ***BP#1*** | ***/BP#1*** | |
| ***6" Concrete Filled Steel Pipe Bollards at Generator & Transformer Pads*** | ***BP#1*** | ***/BP#1*** | |
| **Electrical Utilities** | **136,600 sf** | **/sf** | |
| **31-23 SITEWORK** | **136,600 sf** | **/sf** | |
| **32-10 LANDSCAPING & SITE IMPROVEMENTS** | | | |
| **12.93.00 Site Furnishings** | | | |
| Wood benches | 20 lf | 750.00 /lf | 15,000 |
| Bicycle Racks | 20 ea | 785.00 /ea | 15,700 |
| Basketball Poles & Hoops | 2 ea | 8,000.00 /ea | 16,000 |
| Miscellaneous site furnishings - Allowance | 1 ls | 30,000.00 /ls | 30,000 |
| **Site Furnishings** | **136,600 sf** | **0.56 /sf** | **76,700** |
| **32.01.90 Plant Maintenance** | | | |
| Landscaping maintenance | 1 yr | 8,000.00 /yr | 8,000 |
| **Plant Maintenance** | **136,600 sf** | **0.06 /sf** | **8,000** |
| **32.14.00 Unit Paving** | | | |
| Pavers - plaza paving | 745 sf | 25.00 /sf | 18,625 |
| Stone Dust at Raised Planter | 32 sf | 20.00 /sf | 640 |
| **Unit Paving** | **136,600 sf** | **0.14 /sf** | **19,265** |
| **32.18.00 Athletic & Recreational Surfacing** | | | |
| ***Basketball Court Pavement- (3 1/2" Total Paving w/ Gravel Base) - BP#1*** | ***sf*** | ***/sf*** | |
| Basketball Court Pavement Markings | 1 ls | 2,000.00 /ls | 2,000 |
| **Athletic & Recreational Surfacing** | **136,790 sf** | **0.02 /sf** | **2,000** |
| **32.31.50 Walk / Road / Parking Appurtenances** | | | |
| Flag pole | 1 ea | 9,000.00 /ea | 9,000 |
| ***Bollards - 6" steel w/concrete - BP#1*** | ***BP#1*** | ***/BP#1*** | |
| ***Bollards - 6" steel w/concrete - BP#1*** | ***ea*** | ***/ea*** | |
| ***Bollards - architectural*** | ***0 ea*** | ***/ea*** | |
| **Walk / Road / Parking Appurtenances** | **136,600 sf** | **0.07 /sf** | **9,000** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **32.32.00 Retaining Walls** | | | |
| Segmental retaining wall | 2,600 sf | 50.00 /sf | 130,000 |
| Additional segmental retaining wall per PR #12 | 220 sf | 50.00 /sf | 11,000 |
| **Retaining Walls** | **136,600 sf** | **1.03 /sf** | **141,000** |
| **32.80.00 Irrigation** | | | |
| ***Irrigation system @ south sports field - by others*** | - | /- | |
| Irrigation @ ampitheater - Allowance | 23,435 sf | 2.00 /sf | 46,870 |
| Irrigation system @ north sports field - Allowance | 81,000 sf | 2.00 /sf | 162,000 |
| **Irrigation** | **136,600 sf** | **1.53 /sf** | **208,870** |
| **32.91.00 Planting Preparation** | | | |
| Mulch at trees and planting beds (3") | 240 cy | 105.00 /cy | 25,200 |
| Import loam & spread (6") at Lawns, Athletic Fields & Native Meadows | 5,594 cy | 40.00 /cy | 223,760 |
| Ammend & spread (6") at Lawns, Athletic Fields & Native Meadows | 6,030 cy | 12.00 /cy | 72,360 |
| Import loam & spread (6") at Detention Basins | 802 cy | 40.00 /cy | 32,080 |
| Import loam & spread (12") at Plant Beds | 375 cy | 40.00 /cy | 15,000 |
| Landscape Metal Edging at Building Mow Strip | 2,330 lf | 15.00 /lf | 34,950 |
| Building Mowing Strip- (Peastone) | 100 tn | 50.00 /tn | 5,000 |
| Import loam & spread (6") at Sodded Amphlitheather Lawns | 691 cy | 40.00 /cy | 27,640 |
| **Planting Preparation** | **136,600 sf** | **3.19 /sf** | **435,990** |
| **32.92.00 Turf & Grasses** | | | |
| Fine grade & hydroseed lawn areas | 119,420 sf | 0.30 /sf | 35,826 |
| Fine grade & seed (Native Wildflower Meadow) | 104,005 sf | 0.25 /sf | 26,001 |
| Fine grade & seed (Detention Basin Mix- Hydroseed) | 33,330 sf | 0.25 /sf | 8,333 |
| Fine grade & seed (Natural Turf Fields) | 259,269 sf | 0.25 /sf | 64,817 |
| Sod (Amphiltheather Lawns) | 28,719 sf | 1.50 /sf | 43,079 |
| Sod (100'x170') - Temporary | 17,000 sf | 1.50 /sf | 25,500 |
| Sod northeast - Phase 3 play area, temporary | 5,000 sf | 1.50 /sf | 7,500 |
| Watering for sod areas - Fields | 1 ls | 7,500.00 /ls | 7,500 |
| Watering for sod areas - Amphitheater | 1 ls | 7,500.00 /ls | 7,500 |
| **Turf & Grasses** | **136,600 sf** | **1.66 /sf** | **226,056** |
| **32.93.00 Plants** | | | |
| Trees | 118 ea | 750.00 /ea | 88,500 |
| Shrubs (478 Total) | 7,736 sf | 8.50 /sf | 65,756 |
| Groundcover/perennials | 1,966 ea | 20.00 /ea | 39,320 |
| Plantings @ planter beds | 1 ls | 20,000.00 /ls | 20,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **32.93.00 Plants** | | | |
| ***Rain garden - N/A*** | - | /- | |
| **Plants** | **136,600 sf** | **1.56 /sf** | **213,576** |
| **32-10 LANDSCAPING & SITE IMPROVEMENTS** | **136,600 sf** | **9.81 /sf** | **1,340,457** |
| **32-31 FENCING** | | | |
| **32.31.00 Fences & Gates** | | | |
| ***Wooden Guardrailing*** | ***BP#1*** | ***/BP#1*** | |
| ***Fencing - N/A*** | - | /- | |
| 24' wide Single Arm Gate | 1 ea | 3,500.00 /ea | 3,500 |
| ***Wooden Guardrailing - BP#1*** | ***lf*** | ***/lf*** | |
| **Fences & Gates** | **136,600 sf** | **0.03 /sf** | **3,500** |
| **32-31 FENCING** | **136,600 sf** | **0.03 /sf** | **3,500** |

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|---|---|---|---|---|
| | Job #: | **2043** | | |
| | Project: | **Fuller Middle School** | | |
| | Location: | **Framingham, MA** | | |
| | Date: | **9/9/2019** | | |
| | Proposal: | **General Requirements** | | |
| | Gross Area (SF): | **157,000** | | |

| DESCRIPTION | Fuller Proposed GR | Early Site | Steel & Concrete Package | Remaining |
|---|---|---|---|---|
| **Temp Power - Allowance** | $ 125,000.00 | **$ 5,000.00** | **$ 5,000.00** | $ 115,000 |
| **Temp Heating - Allowance** | $ 80,000.00 | **$ 5,000.00** | **$ 20,000.00** | $ 55,000 |
| **Temp Heating Fuel - Allowance** | $ 50,000.00 | **$ 3,000.00** | **$ 17,000.00** | $ 30,000 |
| **Staging (Auditorium)** | $ 81,000.00 | | | $ 81,000 |
| **Dumpster - Allowance** | $ 125,000.00 | **$ 15,000.00** | **$ 15,000.00** | $ 95,000 |
| **Temp Toilets** | $ 20,000.00 | **$ 5,000.00** | **$ 6,000.00** | $ 9,000 |
| **Project Identification** | $ 10,000.00 | **$ 10,000.00** | **$ -** | $ - |
| **Temporary Barriers** | $ 40,000.00 | **$ 4,000.00** | | $ 36,000 |
| **Temp Fencing** | $ 248,520.00 | **$ 106,792.00** | **$ 57,688.00** | $ 84,040 |
| **Police Details - Allowance** | $ 30,000.00 | **$ 5,000.00** | **$ 10,000.00** | $ 15,000 |
| **Weather Protection - Allowance** | $ 170,000.00 | **$ 10,000.00** | **$ 50,000.00** | $ 110,000 |
| **Winter Conditions - Allowance** | $ 140,000.00 | **$ 5,000.00** | **$ 40,000.00** | $ 95,000 |
| **Carpenter Foreman** | $ 658,908.00 | **$ 85,866.00** | **$ 21,255.00** | $ 551,787 |
| **Labor Foreman** | $ 594,074.00 | **$ 87,362.00** | **$ 35,159.00** | $ 471,553 |
| **Temp Water - Allowance** | $ 20,000.00 | **$ 5,000.00** | **$ 2,500.00** | $ 12,500 |
| **Safety & First Aid** | $ 60,000.00 | **$ 14,000.00** | **$ 21,000.00** | $ 25,000 |
| **Temp. Fire Extinguishers** | $ 10,000.00 | **$ 1,000.00** | **$ 1,500.00** | $ 7,500 |
| **Temp Stair Towers** | $ 120,000.00 | | **$ 12,000.00** | $ 108,000 |
| **Roof Edge Protection** | $ 50,000.00 | | | $ 50,000 |
| **Pest Control** | $ 10,000.00 | **$ 10,000.00** | | $ - |
| **Building Layout** | $ 115,000.00 | **$ 21,000.00** | **$ 30,000.00** | $ 64,000 |
| **Final Cleaning - Interior** | $ 157,000.00 | | | $ 157,000 |
| **Final Cleaning - Glass - Interior** | $ 43,000.00 | | | $ 43,000 |
| **Final Cleaning - Glass - Exterior** | $ 43,000.00 | | | $ 43,000 |
| **Project and Site Traffic Signage (Temp)** | $ 20,000.00 | **$ 9,000.00** | **$ 11,000.00** | $ - |
| **Time Lapse Camera** | $ 17,000.00 | **$ 17,000.00** | | $ - |
| **Storage** | $ 15,000.00 | **$ 3,000.00** | **$ 3,000.00** | $ 9,000 |
| **Security** | $ 17,000.00 | **$ 5,000.00** | **$ 5,000.00** | $ 7,000 |
| **Air Quality Control** | $ 15,000.00 | | | $ 15,000 |
| **TOTAL GENERAL REQUIREMENT COSTS** | $ 3,084,502.00 | **$ 432,020.00** | **$ 363,102.00** | $ 2,289,380.00 |

CONSIGLI
*Est. 1905*

ASSUMPTIONS & QUALIFICATIONS

# FULLER MIDDLE SCHOOL

90% CONSTRUCTION DOCUMENT ESTIMATE
OCTOBER 7, 2019

## GENERAL

1. Pricing is based on the following:
   - 90% Construction Document Pricing Drawings by Jonathan Levi Architects, dated September 9, 2019.
   - 90% Construction Document Pricing Drawings by Jonathan Levi Architects, dated September 9, 2019.
2. Testing and/or inspections are not included.
3. Builders Risk Insurance is included in the Amendment #1 GMP value.
4. Building permit cost is not included.
5. A Payment and Performance Bond is included in the Amendment #1 GMP value.
6. Sales tax is not included as this project is assumed to be tax exempt.
7. Subcontractor insurances are included per Consigli standard subcontract.
8. Utility company back charges, user fees, etc. (temporary electric, water, gas, etc.) are excluded.
9. Work hours are assumed to be normal business hours (7:00AM to 3:00PM) Monday to Friday. Overtime, phasing, or off-hours work costs are not included.
10. Breakouts provided are for informational/accounting purposes only. We reserve the right to reprice our estimate if changes are made to the scope of the project.
11. Site Security costs or provisions are not included.
12. Uniform Fire watch is not included.
13. An exterior mockup is included as an allowance.
14. All design is by the Owner's Designer. Delegated design is excluded.

## TRADE SPECIFIC

15. Hazardous material testing is not included.
16. Removal and/or relocation of furniture is not included.
17. Barrier-1 or similar concrete additives are not included.
18. The concrete floor at the Auditorium is included as polished per sheet A141D.
19. Exterior masonry work includes staging.
20. Interior brick veneer is not shown and therefore not included.
21. White, plain face CMU is included in lieu of all ground face CMU except at the Auditorium per VM Item E02.
22. 82 sf of glass is included at the canopy in lieu of polycarbonate per VM Item E01.
23. The 'summer beams' in Classrooms are included at 11'-6" above the floor per VM Item I11.
24. 1,393 sf of ACT-2 is included in lieu of ACT-3 per VM Item I03.
25. Fluid applied moisture mitigation is not included.
26. Resilient tile base is included as surface applied.
27. Schluter strips are only included at bumper guards per VM Item I10.
28. The Learning Commons stairs are included with rubber treads, risers, and landings.
29. CMU walls are not painted.
30. (3) fume hoods are included.

31. We have not included any costs or provisions for FF & E items and assume this will be by the Owner.
32. The orchestra enclosures are not included. These will be FF & E by the Owner.
33. Mobile cabinets are not included per VM Item I05. They will be FFE by the Owner.
34. Elevator operator costs are included.
35. Hydrant flow tests are not included and are assumed to have been previously completed to inform the fire protection design.
36. A Fire pump is not included.
37. A Domestic Booster pump is not included.
38. A Compressed Air System is not included.
39. Two (2) Gas Fired Domestic water heaters are included.
40. One (1) Domestic Storage tank is included.
41. Laboratory Hot Water piping is wrapped with heat maintenance cable.
42. Gas piping is included to (2) science labs 111A and 1114.
43. Ten (10) Gas Turrets are included.
44. Two (2) interior kitchen grease traps are included.
45. One (1) Exterior 8000 Gallon precast concrete grease trap is included.
46. Radon venting is not included.
47. Primary roof drains and storm piping is included.
48. Overflow secondary roof drains and piping is not included.
49. Interior under-slab drainage is not included.
50. A rainwater reclaim system is not included.
51. Six (6) Acid Neutralization local Chip Tanks are included.
52. Two (2) PH Monitoring panels and sensors are included.
53. Central Acid Neutralization and exterior pump stations are not included.
54. Rectangular, single-walled ductwork is included for supply air medium distribution.
55. VAV's do not include hot water re-heat coils.
56. Electrical and fire alarm permit fee costs are excluded (assumed waived by City of Framingham).
57. Primary cable, primary terminations, and exterior pad mount transformer by Utility Co.
58. Concealed lighting, power, and fire alarm branch circuitry is routed in MC Cable (per NEC Article 330).
59. Distribution feeders are routed in EMT and copper wire (where not required to be MI Cable).
60. Power, switch stations, and LV cable for twenty-five (25) motorized window treatment locations are included.
61. VFD's, motor starters, and motor controllers furnished by Division 23, installed and wired by Division 26.
62. Provisions for a future roof mounted photovoltaic (PV) system are included.
63. Two (2) central uninterruptible power supplies (UPS's) - 480V: 208/120V, 24kW (8 min. backup) - are included.
64. ATS's provided as open transition, with bypass isolation functionality included for legal-required and life-safety.
65. Cable tray is included for MDF and IDF's (200LF total); all other horizontal cabling routed across j-hooks.
66. Audio-visual devices, jacks, cabling, head end equipment, monitors, terminations and labor by Owner's Vendor.
67. Assistive classroom listening systems are not included.

68. Emergency pull-cord or call-for-aid systems are not included.
69. Motorized window treatment power and/or controls are excluded; none are shown on the electrical drawings.
70. Electrical floor boxes and poke-thru devices are not shown on power plans, and none are included in estimate.
71. Theatrical light fixtures, theatrical rigging, and theatrical lighting controls are included with theater equipment.
72. Lighting has been reduced by $1.50/sf per VM Item EL01.
73. Electrical heat trace cabling system or power connections are not included.
74. Exterior site and building mounted lighting are included as shown on drawings E003-1 and E003-2.
75. Addressable fire alarm Notifier system shall be capable of voice evacuation via speaker/strobe appliances; a stand-alone mass notification system is not included.
76. Play field equipment is not included.
77. Fencing is not shown and therefore not included.

## ALLOWANCES

| | | |
|---|---|---|
| 78. | Exterior wall mockup (excluding Concrete and Steel). | $55,000 |
| 79. | Miscellaneous rough carpentry. | $68,300 |
| 80. | Level 5 finish. | $63,750 |
| 81. | Miscellaneous specialties. | $34,150 |
| 82. | Food service equipment. | $415,270 |
| 83. | Sound systems. | $450,000 |
| 84. | Theater and stage equipment. | $416,921 |
| 85. | Miscellaneous lab equipment. | $25,000 |
| 86. | Theater lighting power and rough in. | $37,600 |
| 87. | Miscellaneous site furnishings. | $30,000 |
| 88. | Irrigation. | $208,870 |

### 2.3.5 Reconciled Cost Estimate - Designer

Attached is the reconciled Designer Cost Estimate.

# *Fuller Middle School*

Framingham, MA

**October 9, 2019**

**90% Construction Documents Estimate**

**Owner's Project Manager**

SMMA

1000 Massachusetts Ave.

Cambridge, MA

**Architect:**

Jonathan Levi Architects
266 Beacon Street
Boston, MA  02116


**Estimator:**

Miyakoda Consulting

PO Box 47

Raynham, MA  02767

(617) 799-5832


miyakoda CONSULTING

# *Fuller Middle School*

Fuller Middle School

## *INTRODUCTION*

### *Description:*

Construction of the Framingham Middle School
The scope of the work includes all related sitework, hardscape/landscape, and underground utilities

### *Particulars:*

90% CD Drawings and Specifications dated September 9, 2019, received from Jonathan Levi Architects
Detailed quantity takeoff from these documents where possible
Experience with similar projects of this nature with JLA

### *Assumptions:*

The project will be constructed by a Construction Manager
Our costs assume that there will be at least three subcontractors submitting unrestricted bids in each sub-trade
Unit rates are based on current dollars
General Conditions and Requirements value covers Sub-Contractor's bond, site office overheads, and building permit applications
Fee markup is calculated on a percentage basis of direct construction costs. The value covers Contractor's bond, insurance and profit
Design and Pricing Contingency markup is an allowance for unforeseen design issues, design detail development and specification clarifications
Escalation has been included to midpoint of construction. The construction start date is June 2020.

### Exclusions:

Design fees and other soft costs
Owner's project administration
Construction of temporary facilities
Relocation expenses
Printing and advertising
Existing condition surveys and investigations
Work beyond the boundary of the site
Testing
Specialties, loose furnishings, fixtures and equipment beyond those noted
Preconstruction Fee
Traffic Improvements

# *Fuller Middle School*

Fuller Middle School
137,385 GSF

## *MAIN SUMMARY - NEW CONSTRUCTION*

| | *DESCRIPTION* | | | *TOTAL* | *COST/SF* |
|---|---|---|---|---|---|
| 39 | **Direct Trade Costs With Site** | | | | |
| 40 | New Construction | 137,385 GSF | | $42,543,874 | $309.67 |
| 41 | Site Development | | | $1,401,720 | $10.20 |
| 42 | **Direct Trade Cost SubTotal** | | | **$43,945,594** | **$319.87** |
| 43 | | | | | |
| 44 | Demolish Existing Building | 195,400 GSF | | $1,465,500 | $10.67 |
| 45 | Hazardous Waste Abatement (Budget provided) | | | $1,294,490 | $9.42 |
| 46 | **Building Cost Subtotal** | | | **$46,705,584** | **$339.96** |
| 47 | | | | | |
| 48 | Design and Pricing Contingency | 3.00% | $46,705,584 | $1,401,168 | $10.20 |
| 49 | | | | | |
| 50 | **Building Cost Total** | | | **$48,106,752** | **$350.16** |
| 51 | | | | | |
| 52 | Escal. to Midpoint of Construction (Consigli %) | 1.00% | $48,106,752 | $481,068 | $3.50 |
| 53 | **Trade Cost SubTotal** | | | **$48,587,820** | **$353.66** |
| 54 | | | | | |
| 55 | General Conditions | | | $2,931,033 | $21.33 |
| 56 | General Requirements | | | $2,289,380 | $16.66 |
| 57 | SDI | | | $269,858 | $1.96 |
| 58 | Sub Bonds | | | $403,034 | $2.93 |
| 59 | General Liability Insurance | | | $576,109 | $4.19 |
| 60 | Construction Contingency | 2.50% | $55,057,234 | $1,376,431 | $10.02 |
| 61 | CM Fee | | | $1,152,218 | $8.39 |
| 62 | | | | | |
| 63 | **BP#1** | | | $10,957,843 | $79.76 |
| 64 | **BP#2** | | | $8,738,800 | $63.61 |
| 65 | **BP#2 Savings** | | | ($50,755) | |
| 66 | ***Estimated Construction Cost Total*** | | | **$77,231,771** | **$562.16** |
| 67 | | | | | |
| 68 | | | | | |
| 69 | | | | | |
| 70 | | | | | |
| 71 | | | | | |
| 72 | | | | | |
| 73 | | | | | |

# *Fuller Middle School*

Framingham, MA

## DIRECT TRADE COSTS SUMMARY - CSI

**137,385 GSF**

| | *Element* | *Filed Sub Bid* | *SITEWORK* | *BUILDING* | *TOTAL* | *$/GSF* |
|---|---|---|---|---|---|---|
| 74 | 02 30 00 Building Demolition | | | | $0 | $0.00 |
| 75 | 02 41 00 Demolition | | $0 | | $0 | $0.00 |
| 76 | 02 60 00 Hazardous Waste Remediation | | | $0 | $0 | $0.00 |
| 77 | **02-EXISTING CONDITIONS** | | **$0** | **$0** | **$0** | **$0.00** |
| 78 | | | | | | |
| 79 | 03 30 00 Cast-In-Place Concrete | | | $45,648 | $45,648 | $0.33 |
| 80 | **03-CONCRETE** | | **$0** | **$45,648** | **$45,648** | **$0.33** |
| 81 | | | | | | |
| 82 | 04 20 00 Unit Masonry | *$2,338,257* | | $2,338,257 | $2,338,257 | $17.02 |
| 83 | **04-MASONRY** | | **$0** | **$2,338,257** | **$2,338,257** | **$17.02** |
| 84 | | | | | | |
| 85 | 05 12 00 Structural Steel Framing | | | $0 | $0 | $0.00 |
| 86 | 05 31 00 Steel Decking | | | $0 | $0 | $0.00 |
| 87 | 05 40 00 Cold-Formed Metal Framing | | | $0 | $0 | $0.00 |
| 88 | 05 50 00* Miscellaneous and Ornamental Iron | *$836,941* | | $836,941 | $836,941 | $6.09 |
| 89 | **05-METALS** | | **$0** | **$836,941** | **$836,941** | **$6.09** |
| 90 | | | | | | |
| 91 | 06 10 00 Rough Carpentry | | | $0 | $0 | $0.00 |
| 92 | 06 16 50 Gypsum Sheathing | | | $0 | $0 | $0.00 |
| 93 | 06 20 00 Finish Carpentry | | | $1,692,555 | $1,692,555 | $12.32 |
| 94 | 06 40 00 Architectural Woodwork | | | $88,675 | $88,675 | $0.65 |
| 95 | **06-WOOD, PLASTICS & COMPOSITES** | | | **$1,781,230** | **$1,781,230** | **$12.97** |
| 96 | | | | | | |
| 97 | 07 00 01* Waterproofing, Dampproofing & Caulking | *$475,977* | | $475,977 | $475,977 | $3.46 |
| 98 | 07 00 02* Roofing & Flashing | *$1,577,545* | | $1,577,545 | $1,577,545 | $11.48 |
| 99 | 07 42 00 Wall Panels | | | $1,289,894 | $1,289,894 | $9.39 |
| 100 | 07 81 00 Applied Fireproofing | | | $395,500 | $395,500 | $2.88 |
| 101 | 07 84 10 Penetration Firestopping | | | $0 | $0 | $0.00 |
| 102 | **07-THERMAL AND MOISTURE PROTECTION** | | | **$3,738,916** | **$3,738,916** | **$27.21** |
| 103 | | | | | | |
| 104 | 08 11 10 Hollow Metal Doors and Frames | | | $284,350 | $284,350 | $2.07 |
| 105 | 08 14 00 Flush Wood Doors | | | $10,000 | $10,000 | $0.07 |
| 106 | 08 31 10 Access Doors & Frames | | | $30,000 | $30,000 | $0.22 |
| 107 | 08 33 10 Overhead Coiling Doors | | | $50,433 | $50,433 | $0.37 |
| 108 | 08 00 01* Metal Windows | | | $2,482,125 | $2,482,125 | $18.07 |
| 109 | 08 63 00 Metal-Framed Skylights | | | $0 | $0 | $0.00 |
| 110 | 08 71 00 Door Hardware | | | $406,000 | $406,000 | $2.96 |
| 111 | 08 00 02* Glass and Glazing | *$986,525* | | $986,525 | $986,525 | $7.18 |
| 112 | 08 90 00 Louvers and Vents | | | $53,125 | $53,125 | $0.39 |
| 113 | **08-OPENINGS** | | | **$4,302,558** | **$4,302,558** | **$31.32** |
| 114 | | | | | | |
| 115 | 09 29 00 Gypsum Drywall | | | $5,627,244 | $5,627,244 | $40.96 |
| 116 | 09 30 00* Tiling | *$322,777* | | $322,777 | $322,777 | $2.35 |
| 117 | 09 50 01* Acoustical Ceilings | *$763,811* | | $763,811 | $763,811 | $5.56 |
| 118 | 09 60 01* Resilient Flooring | *$787,389* | | $787,389 | $787,389 | $5.73 |

# *Fuller Middle School*

Framingham, MA

## DIRECT TRADE COSTS SUMMARY - CSI

**137,385 GSF**

| | *Element* | *Filed Sub Bid* | *SITEWORK* | *BUILDING* | *TOTAL* | *$/GSF* |
|---|---|---|---|---|---|---|
| 119 | 09 64 00 Wood Flooring | | | $48,495 | $48,495 | $0.35 |
| 120 | 09 64 40 Wood Athletic Flooring | | | $210,125 | $210,125 | $1.53 |
| 121 | 09 67 23 Resinous Flooring | | | $119,100 | $119,100 | $0.87 |
| 122 | 09 68 00 Carpeting | | | $27,700 | $27,700 | $0.20 |
| 123 | 09 72 00 Wall Coverings | | | $449,932 | $449,932 | $3.27 |
| 124 | 09 91 00* Painting | *$556,240* | | $556,240 | $556,240 | $4.05 |
| 125 | **09-FINISHES** | | | **$8,912,813** | **$8,912,813** | **$64.87** |
| 126 | | | | | | |
| 127 | 10 00 01 Specialties | | | $299,200 | $299,200 | $2.18 |
| 128 | 10 11 00 Visual Display Boards | | | $377,584 | $377,584 | $2.75 |
| 129 | 10 14 23 Signage | | | $72,634 | $72,634 | $0.53 |
| 130 | 10 21 13 Plastic Toilet Compartments | | | $59,600 | $59,600 | $0.43 |
| 131 | 10 21 23 Cubicle Curtains, Tracks & Hardware | | | $400 | $400 | $0.00 |
| 132 | 10 26 00 Wall Protection | | | $10,000 | $10,000 | $0.07 |
| 133 | 10 28 13 Toilet Accessories | | | $23,880 | $23,880 | $0.17 |
| 134 | 10 44 13 Fire Protection SpeciaLSies | | | $7,982 | $7,982 | $0.06 |
| 135 | 10 51 24 Phenolic-Core Lockers | | | $435,000 | $435,000 | $3.17 |
| 136 | **10-SPECIALTIES** | | | **$1,286,280** | **$1,286,280** | **$9.36** |
| 137 | | | | | | |
| 138 | 11 00 00 Equipment | | | $150,000 | $150,000 | $1.09 |
| 139 | 11 31 00 Appliances | | | $10,900 | $10,900 | $0.08 |
| 140 | 11 40 00 Food Service Equipment | | | $415,270 | $415,270 | $3.02 |
| 141 | 11 52 13 Projection Screens | | | $23,000 | $23,000 | $0.17 |
| 142 | 11 61 00 Theater and Stage Equipment | | | $953,366 | $953,366 | $6.94 |
| 143 | 11 66 23 Gymnasium Equipment | | | $103,412 | $103,412 | $0.75 |
| 144 | 11 66 53 Gymnasium Dividers | | | $20,000 | $20,000 | $0.15 |
| 145 | 11 66 80 Scoreboards | | | $7,500 | $7,500 | $0.05 |
| 146 | **11-EQUIPMENT** | | | **$1,683,448** | **$1,683,448** | **$12.25** |
| 147 | | | | | | |
| 148 | 12 24 12 Roller Shades | | | $177,207 | $177,207 | $1.29 |
| 149 | 12 35 53 Caswork | | | $273,165 | $273,165 | $1.99 |
| 150 | 12 48 13 Entrance Mats & Frames | | | $13,860 | $13,860 | $0.10 |
| 151 | 12 66 00 Telescoping Stands | | | $76,000 | $76,000 | $0.55 |
| 152 | **12-FURNISHING** | | | **$540,232** | **$540,232** | **$3.93** |
| 153 | | | | | | |
| 154 | 13 00 00 Special Construction | | | $0 | $0 | $0.00 |
| 155 | **13-SPECIAL CONSTRUCTION** | | | **$0** | **$0** | **$0.00** |
| 156 | | | | | | |
| 157 | 14 24 00* Hydraulic Elevators | *$215,000* | | $215,000 | $215,000 | $1.56 |
| 158 | **14-CONVEYING EQUIPMENT** | | | **$215,000** | **$215,000** | **$1.56** |
| 159 | | | | | | |
| 160 | 21 00 00* Fire Protection | *$962,994* | | $962,994 | $962,994 | $7.01 |
| 161 | 22 00 00* Plumbing | *$2,126,673* | | $2,126,673 | $2,126,673 | $15.48 |
| 162 | 23 00 00* HVAC | *$7,879,869* | | $7,879,869 | $7,879,869 | $57.36 |
| 163 | **21 - 23-MECHANICAL** | | | **$10,969,536** | **$10,969,536** | **$79.85** |

# *Fuller Middle School*

Framingham, MA

## DIRECT TRADE COSTS SUMMARY - CSI

**137,385 GSF**

| | *Element* | *Filed Sub Bid* | *SITEWORK* | *BUILDING* | *TOTAL* | *$/GSF* |
|---|---|---|---|---|---|---|
| 164 | | | | | | |
| 165 | 26 00 00* Electrical | *$5,893,015* | $0 | $5,893,015 | $5,893,015 | $42.89 |
| 166 | **26,27,28-ELECTRICAL, COMMUNICATION, SECURITY** | | **$0** | **$5,893,015** | **$5,893,015** | **$42.89** |
| 167 | | | | | | |
| 168 | 31 00 00 Earthwork | | $0 | $0 | $0 | $0.00 |
| 169 | 31 10 00 Site Clearing | | $0 | | $0 | $0.00 |
| 170 | 31 23 19 Dewatering and Drainage | | $0 | | $0 | $0.00 |
| 171 | 31 25 00 Erosion and Sedimentation Controls | | $0 | | $0 | $0.00 |
| 172 | **31-EARTHWORK** | | **$0** | **$0** | **$0** | **$0.00** |
| 173 | | | | | | |
| 174 | 32 12 00 Flexible Paving | | $0 | | $0 | $0.00 |
| 175 | 32 14 00 Unit Paving | | $0 | | $0 | $0.00 |
| 176 | 32 16 00 Curbs and Gutters | | $0 | | $0 | $0.00 |
| 177 | 32 17 00 Paving Specialties | | $0 | | $0 | $0.00 |
| 178 | 32 30 00 Site Improvements | | $267,425 | | $267,425 | $1.95 |
| 179 | 32 31 00 Fences and Gates | | $89,750 | | $89,750 | $0.65 |
| 180 | 32 32 00 Retaining Walls | | $0 | | $0 | $0.00 |
| 181 | 32 80 00 Irrigation | | $0 | | $0 | $0.00 |
| 182 | 32 92 00 Turfs and Grasses | | $819,947 | | $819,947 | $5.97 |
| 183 | 32 93 00 Plants | | $224,598 | | $224,598 | $1.63 |
| 184 | **32-EXTERIOR IMPROVEMENTS** | | **$1,401,720** | | **$1,401,720** | **$10.20** |
| 185 | | | | | | |
| 186 | 33 10 00 Water Distribution | | $0 | | $0 | $0.00 |
| 187 | 33 31 00 Sanitary Sewerage | | $0 | | $0 | $0.00 |
| 188 | 33 41 00 Storm Utility Drainage | | $0 | | $0 | $0.00 |
| 189 | 33 50 00 Gas Service | | $0 | | $0 | $0.00 |
| 190 | **33-UTILITIES** | | **$0** | | **$0** | **$0.00** |
| 191 | | | | | | |
| 192 | | | | | | |
| 193 | | | | | | |
| 194 | **Direct Trade Costs Subtotal** | ***$25,723,013*** | **$1,401,720** | **$42,543,874** | **$43,945,594** | **$319.87** |
| 195 | | | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 196 | **02-EXISTING CONDITIONS** | | | | |
| 197 | | | | | |
| 198 | **02 60 00 Hazardous Waste Remediation** | | | | |
| 199 | Removal and disposal of hazardous materials | | | | Main Summary |
| 200 | **02 60 00 Hazardous Waste RemediationTotal** | | | | |
| 201 | | | | | |
| 202 | | | | | |
| 203 | **03-CONCRETE** | | | | |
| 204 | | | | | |
| 205 | **03 30 00 Cast-In-Place Concrete** | | | | |
| 206 | A1010 FOUNDATIONS | | | | |
| 207 | Concrete | | | | |
| 208 | Continuous footings; 3' x 1' 0" typ. | **2,049** | LF | | |
| 209 | 4' x 1' 0" | | | | |
| 210 | 5' x 1' 0" | | | | |
| 211 | Concrete; material | **247** | CY | $135.00 | BP#2 |
| 212 | Concrete; place (combination of pumping/trucking) | **247** | CY | $95.00 | BP#2 |
| 213 | Reinforcement w/ftn wall dowels (10#/lf) | **20,490** | LB | $1.15 | BP#2 |
| 214 | Formwork | **8,196** | SF | $12.00 | BP#2 |
| 215 | Spread footings | **133** | EA | | |
| 216 | Concrete; material | **465** | CY | $135.00 | BP#2 |
| 217 | Concrete; place | **465** | CY | $95.00 | BP#2 |
| 218 | Reinforcement (100#/cy) | **46,500** | LB | $1.15 | BP#2 |
| 219 | Formwork | **6,406** | SF | $12.00 | BP#2 |
| 220 | Pilasters | **133** | EA | $1,100.00 | BP#2 |
| 221 | Grade beam GB-1, GB-2 | **288** | LF | | |
| 222 | Concrete; material | **57** | CY | $135.00 | BP#2 |
| 223 | Concrete; place (combination of pumping/trucking) | **57** | CY | $95.00 | BP#2 |
| 224 | Reinforcement (125#/cy) | **7,125** | LB | $1.15 | BP#2 |
| 225 | Formwork | **1,940** | SF | $12.00 | BP#2 |
| 226 | Foundation and frost walls; 16" thick x 4' 0" high typ. | **8,551** | SF | | |
| 227 | Concrete; material | **443** | CY | $135.00 | BP#2 |
| 228 | Concrete; place | **443** | CY | $95.00 | BP#2 |
| 229 | Reinforcement (150#/cy) | **66,450** | LB | $1.15 | BP#2 |
| 230 | Formwork | **17,212** | SF | $8.00 | BP#2 |
| 231 | Foundation walls; 21" thick x 4' 0" high typ. | **1,645** | SF | | |
| 232 | Concrete; material | **112** | CY | $135.00 | BP#2 |
| 233 | Concrete; place | **112** | CY | $95.00 | BP#2 |
| 234 | Reinforcement (150#/cy) | **16,800** | LB | $1.15 | BP#2 |
| 235 | Formwork | **3,289** | SF | $8.00 | BP#2 |
| 236 | Brick shelf | **2,049** | LF | $5.00 | BP#2 |
| 237 | Elevator pit; slab and walls | **1** | EA | $5,000.00 | BP#2 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 238 | Anchor bolts | **532** | SET | $35.00 | BP#2 |
| 239 | 6" Ø hole through wall, backfill w/crushed stone | **4** | EA | $500.00 | BP#2 |
| 240 | | | | | |
| 241 | Bandshell | | | | |
| 242 | Footing | **46** | lf | | |
| 243 | Concrete; material | **7** | CY | $135.00 | BP#2 |
| 244 | Concrete; place | **7** | CY | $95.00 | BP#2 |
| 245 | Reinforing | **455** | LBS | $1.15 | BP#2 |
| 246 | Formwork | **96** | SF | $9.00 | BP#2 |
| 247 | Wall | **182** | sf | | |
| 248 | Concrete | **10** | CY | $135.00 | BP#2 |
| 249 | Placing | **10** | CY | $95.00 | BP#2 |
| 250 | Reinforing | **1,500** | LBS | $1.15 | BP#2 |
| 251 | Formwork | **382** | SF | $8.00 | BP#2 |
| 252 | Concrete steps | **556** | LFR | $150.00 | BP#2 |
| 253 | Concrete steps , amphitheatre steps | **385** | LFR | $125.00 | BP#2 |
| 254 | Miscellaneous concrete | | | | |
| 255 | Ground improvements | | | | BP#1 |
| 256 | | | | | |
| 257 | Special Foundation Conditions | | | | |
| 258 | Dewatering during excavation | | | | BP#1 |
| 259 | | | | | |
| 260 | Thermal & Moisture Protection | | | | |
| 261 | 2" rigid insulation at foundation walls | **10,195** | SF | $2.50 | $25,488 |
| 262 | | | | | |
| 263 | *A1030 SLAB ON GRADE* | | | | |
| 264 | Concrete | | | | |
| 265 | Slab on grade, 5" thick, WWF, top of slab 314' 0" | **66,213** | SF | | |
| 266 | Concrete; material | **1,030** | CY | $135.00 | BP#2 |
| 267 | Concrete; place & finish | **66,213** | SF | $2.85 | BP#2 |
| 268 | Reinforcement (6x6 mesh) | **76,145** | SF | $1.00 | BP#2 |
| 269 | Slab depressions | **1,243** | LF | $65.00 | BP#2 |
| 270 | Slab thickening at stair 5'x2'x1' deep | **6** | LOC | $2,500.00 | BP#2 |
| 271 | Slab on grade at loading dock, 6" thick, #4 bars | **350** | SF | | |
| 272 | Concrete; material | **6** | CY | $135.00 | BP#2 |
| 273 | Concrete; place & finish | **350** | SF | $2.85 | BP#2 |
| 274 | Reinforcement; #4@12"bew | **469** | LBS | $1.45 | BP#2 |
| 275 | Miscellaneous | | | | |
| 276 | Concrete ramp @ Auditorium | **2,440** | SF | $18.00 | BP#2 |
| 277 | Sloped walkway @ Cohort/Learning Common/Stage | **320** | SF | $20.00 | BP#2 |
| 278 | Housekeeping & mechanical equipment pads | **1** | LS | $5,000.00 | BP#2 |
| 279 | Miscellaneous concrete | | | | BP#2 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 280 | | | | | |
| 281 | B1010 UPPER FLOOR CONSTRUCTION | | | | |
| 282 | Concrete | | | | |
| 283 | Slab on deck topping, 3¼" light weight, WWF | **69,572** | SF | | |
| 284 | Concrete; material | **966** | CY | $135.00 | BP#2 |
| 285 | Reinforcement (6x6 mesh) | **76,529** | SF | $1.00 | BP#2 |
| 286 | Rebar at corners and openings | **3,826** | LBS | $1.15 | BP#2 |
| 287 | Concrete; place & finish | **69,572** | SF | $5.00 | BP#2 |
| 288 | Beam pocket | **23** | EA | $750.00 | BP#2 |
| 289 | | | | | |
| 290 | Concrete | | | | |
| 291 | Slab on deck topping, 3¼" light weight, WWF | **1,600** | SF | | |
| 292 | Concrete; material | **22** | CY | $135.00 | BP#2 |
| 293 | Reinforcement (6x6 mesh) | **1,760** | SF | $1.00 | BP#2 |
| 294 | Rebar at corners and openings | **88** | LBS | $1.15 | BP#2 |
| 295 | Concrete; place & finish | **1,600** | SF | $5.00 | BP#2 |
| 296 | | | | | |
| 297 | slab on grade power troweled concrete at seats | **2,240** | SF | $9.00 | $20,160 |
| 298 | | | | | |
| 299 | PC; power troweled concrete @ Makerspace, Auditorium, AV | **2,018** | SF | $9.00 | BP#2 |
| 300 | | | | | |
| 301 | **03 30 00 Cast-In-Place Concrete Total** | | | | **$45,648** |
| 302 | | | | | |
| 303 | | | | | |
| 304 | **04-MASONRY** | | | | |
| 305 | | | | | |
| 306 | **04 20 00 Unit Masonry** | | | | |
| 307 | 12" CMU wall reinforced; Gym & Auditorium, double hgt | **7,942** | SF | $28.00 | $222,376 |
| 308 | 8" CMU wall, load bearing wall @ Auditorium | **1,284** | SF | $24.00 | $30,816 |
| 309 | Stairs/elevator CMU wall | **3,266** | SF | $24.00 | $78,384 |
| 310 | Premium for Acoustical Block | **1,000** | SF | $6.00 | $6,000 |
| 311 | Exterior brick wall; scored brick veneer, "modular" 8x8x4 , and "utility" 4x12x4, iron spot finish | **17,333** | SF | $35.00 | $606,655 |
| 312 | Exterior CMU wall; 8x12x16 , 4x8x16, and "utility" 4x12x4 | **24,140** | SF | $29.83 | $720,096 |
| 313 | 12" Reinforced ground face CMU wall backup @ Auditorium & Gym | **14,805** | SF | $26.00 | $384,930 |
| 314 | Cont galv relieving angle at masonry wall | **1,038** | LF | $100.00 | BP#2 |
| 315 | 4" Utility brick, both sides @ parapet wall, Main Entrance | **175** | SF | $32.00 | $5,600 |
| 316 | Precast colored coping on top of parapet wall | **26** | LF | $150.00 | $3,900 |
| 317 | Premium for custom brick and CMU @ lintels & shelves | **1,128** | LF | $50.00 | $56,400 |
| 318 | Precast planter | **50** | LF | $750.00 | $37,500 |
| 319 | Through wall sheet metal flashing | **1,424** | LF | $25.00 | $35,600 |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 320 | Exterior mockup | **1** | LS | $50,000.00 | $50,000 |
| 321 | Temporary | **1** | LS | $100,000.00 | $100,000 |
| 322 | **04 20 00 Unit Masonry Total** | | | | **$2,338,257** |
| 323 | | | | | |
| 324 | | | | | |
| 325 | **05-METALS** | | | | |
| 326 | | | | | |
| 327 | **05 12 00 Structural Steel Framing** | | | | |
| 328 | Structural Steel Framing | **793** | TNS | | |
| 329 | Steel floor framing | | | | |
| 330 | Wide flange beams | **243** | TNS | $3,700.00 | BP#2 |
| 331 | Wide flange beams > 100 | **36** | TNS | $3,950.00 | BP#2 |
| 332 | HSS-shapes | **47** | TNS | $4,150.00 | BP#2 |
| 333 | W-shapes ; columns | **14** | TNS | $3,950.00 | BP#2 |
| 334 | HSS-shapes; columns | **101** | TNS | $4,150.00 | BP#2 |
| 335 | HSS brace frames | **40** | TNS | $4,250.00 | BP#2 |
| 336 | Remainder of steel framing; beams, columns, bridging | **26** | TNS | $4,150.00 | BP#2 |
| 337 | Plates, bent plates and angles | **133** | EA | $75.00 | BP#2 |
| 338 | Moment connections | **157** | EA | $750.00 | BP#2 |
| 339 | Shear studs | **10,170** | EA | $5.50 | BP#2 |
| 340 | 3" deep x 18ga galv composite floor deck | **71,172** | SF | $4.25 | BP#2 |
| 341 | | | | | |
| 342 | Structural steel roof framing | **286** | TNS | | |
| 343 | Wide flange beams | **124** | TNS | $3,650.00 | BP#2 |
| 344 | Wide flange beams > 100 | **87** | TNS | $3,900.00 | BP#2 |
| 345 | HSS-shape | **18** | TNS | $4,100.00 | BP#2 |
| 346 | Support post HSS7.625x0.375; RTU screen | **2** | TNS | $4,100.00 | BP#2 |
| 347 | L- ledger; L4x4x1/4 anchored to CMU, roof | **1** | TNS | $3,550.00 | BP#2 |
| 348 | Roof steel framing incl's hanger support beam, 52DLH17, HSS trus | **42** | TNS | $4,100.00 | BP#2 |
| 349 | Add reinforcement 7#/sf hot dip galv steel @ RTU | **12** | TNS | $4,100.00 | BP#2 |
| 350 | Moment connections | **241** | EA | $750.00 | BP#2 |
| 351 | Roof hanger @ main roof | **47** | EA | $1,500.00 | BP#2 |
| 352 | 3/4" rod hanger @ Gym and Auditorium roof | **11** | EA | $1,500.00 | BP#2 |
| 353 | Other misc plates, connections | **65,518** | SF | $4.50 | BP#2 |
| 354 | Premium for galv steel framing | **14** | TNS | $500.00 | BP#2 |
| 355 | 3" deep x 18ga galv comp roof deck (w/conc topping) | **40,338** | SF | $4.25 | BP#2 |
| 356 | R3; 3" 18 ga roof deck above Learning Commons | **8,610** | SF | $4.25 | BP#2 |
| 357 | R3C; 3" Cellular 18/16 ga roof deck, galv at Auditorium | **7,615** | SF | $4.25 | BP#2 |
| 358 | R1.5; 1.5" 20 ga roof deck, Gym equipment storage | **835** | SF | $6.00 | BP#2 |
| 359 | R1.5A; 1.5" Cellular acoustic 20 ga roof deck, galv at Gym | **8,120** | SF | $6.50 | BP#2 |
| 360 | | | | | |
| 361 | Roof screen, galv; HSS shapes | **15** | TNS | $3,950.00 | BP#2 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 362 | **05 12 00 Structural Steel Framing Total** | | | | |
| 363 | | | | | |
| 364 | **05 31 00 Steel Decking** | | | | |
| 365 | With Structural Steel | | | | |
| 366 | **05 31 00 Steel Decking Total** | | | | |
| 367 | | | | | |
| 368 | **05 40 00 Cold-Formed Metal Framing** | | | | |
| 369 | Light gage metal framing | | | | Div 09 |
| 370 | **05 40 00 Cold-Formed Metal Framing Total** | | | | |
| 371 | | | | | |
| 372 | **05 50 00* Miscellaneous and Ornamental Iron** | | | | |
| 373 | Interior guardrails | | | | |
| 374 | Handrailing | **150** | LF | $200.00 | $30,000 |
| 375 | Guardrail in Common areas | **365** | LF | $103.00 | $37,595 |
| 376 | Guardrails at lockers | **1,000** | LF | $550.00 | BP#2 |
| 377 | Railings in auditorium | **1** | LS | $35,000.00 | $35,000 |
| 378 | Trim detail | **10,805** | LF | $15.00 | $162,075 |
| 379 | | | | | |
| 380 | Furnishings; miscellaneous metals | **137,385** | GSF | $0.25 | $34,346 |
| 381 | | | | | |
| 382 | Elevator pit ladder | **1** | EA | $1,500.00 | $1,500 |
| 383 | Elevator vent | **1** | EA | $1,200.00 | $1,200 |
| 384 | Sill angles | **4** | EA | $175.00 | $700 |
| 385 | Hoist beam | **1** | EA | $5,000.00 | $5,000 |
| 386 | | | | | |
| 387 | Interior stairs | | | | |
| 388 | Egress stairs | **6** | FLT | $25,000.00 | $150,000 |
| 389 | Monumental/open stairs #4 & #5 | | | | BP#2 |
| 390 | Monumental/open stairs #3 | **1** | FLT | $65,000.00 | $65,000 |
| 391 | | | | | |
| 392 | Stair finishes | | | | |
| 393 | Railings | **165** | LF | $550.00 | $90,750 |
| 394 | | | | | |
| 395 | Miscellaneous metals for fittings | **137,385** | GSF | $0.50 | $68,693 |
| 396 | Misc metals for interior construction | **137,385** | GSF | $0.50 | $68,693 |
| 398 | Roof dunnage (SS) | **7** | TNS | $7,500.00 | BP#2 |
| 399 | | | | | |
| 400 | Galvanized bar grating | **1,000** | SF | $55.00 | BP#2 |
| 401 | | | | | |
| 402 | Loose lintel @ exterior wall openings | **90** | LF | $200.00 | $18,000 |
| 403 | Miscellaneous metals in exterior closure | **57,520** | SF | $0.50 | $28,760 |
| 404 | | | | | |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 405 | Operable partition framing support beam | **633** | LF | $175.00 | BP#2 |
| 406 | Monumental/open stairs #4 & #5 | **460** | LFR | $85.00 | BP#2 |
| 407 | Monumental/open stairs | **460** | LFR | $85.00 | $39,100 |
| 408 | | | | | |
| 409 | Galvanized handrails @ ramps and steps | **219** | LF | $250.00 | $54,750 |
| 410 | **05 50 00* Miscellaneous and Ornamental Iron Total** | | | | **$836,941** |
| 411 | | | | | |
| 412 | | | | | |
| 413 | **06-WOOD, PLASTICS & COMPOSITES** | | | | |
| 414 | | | | | |
| 415 | **06 10 00 Rough Carpentry** | | | | |
| 416 | See 09 | | | | |
| 417 | **06 10 00 Rough Carpentry Total** | | | | |
| 418 | | | | | |
| 419 | **06 16 50 Gypsum Sheathing** | | | | |
| 420 | Included | | | | |
| 421 | **06 16 50 Gypsum Sheathing Total** | | | | |
| 422 | | | | | |
| 423 | **06 20 00 Finish Carpentry** | | | | |
| 424 | Window stools - Plam | **1,250** | LF | $50.00 | $62,500 |
| 425 | | | | | |
| 426 | *Toilets* | | | | |
| 427 | Vanity counter; Toilets | **319** | LF | $200.00 | $63,800 |
| 428 | Vanity counter; Dressing | **33** | LF | $200.00 | $6,600 |
| 429 | | | | | |
| 430 | *Auditorium walls:* | | | | |
| 431 | Plam wall panel to auditorium | **2,900** | SF | $50.00 | $145,000 |
| 432 | FRP; fiber reinforced panels in Kitchen | **1,921** | SF | $15.00 | $28,815 |
| 433 | | | | | |
| 434 | Solid epoxy backsplash | **650** | SF | $75.00 | $48,750 |
| 435 | | | | | |
| 436 | Wood MDF Trim | **1,700** | LF | $30.00 | $51,000 |
| 437 | Plam fin tube cover with lip | **570** | LF | $60.00 | $34,200 |
| 438 | P.lam panel wall cover at Breakout Room | **330** | SF | $50.00 | $16,500 |
| 439 | | | | | |
| 440 | Plam bumper w/marker tray | **2,915** | LF | $100.00 | $291,500 |
| 441 | Maple rail | **1,600** | LF | $50.00 | $80,000 |
| 442 | | | | | |
| 443 | Wall panels at auditorium | **1,500** | SF | $85.00 | $127,500 |
| 444 | Backsplash | **1,100** | SF | $75.00 | $82,500 |
| 445 | | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 446 | Academic areas: classrooms, science, media, music, vocational, sped | | | | |
| 447 | Bench; wood veneer cantilevered w/ptd supports | **205** | LF | $350.00 | $73,850 |
| 448 | | | | | |
| 449 | Plam admin desk, curved @ Admin | **20** | LF | $500.00 | $10,000 |
| 450 | Plam base cabinet | **35** | LF | $205.00 | $7,175 |
| 451 | Plam base cabinet; mobile on casters | **175** | EA | $550.00 | FF&E |
| 452 | Plam counter 24" wide | **1,425** | LF | $200.00 | $285,000 |
| 453 | Plam tall cabinets | **4** | EA | $1,000.00 | $4,000 |
| 454 | Plam tall cabinets w/tackable surface | **3** | EA | $1,250.00 | $3,750 |
| 455 | Plam upper cabinet | **197** | LF | $175.00 | $34,475 |
| 456 | Plam work counter oval @ Admin | **10** | LF | $350.00 | $3,500 |
| 457 | Free standing bench | **34** | LF | $500.00 | $17,000 |
| 458 | Display cases | **5** | EA | $5,000.00 | $25,000 |
| 459 | Mobil Storage | **172** | EA | $1,000.00 | $172,000 |
| 460 | plam custom base & upper cabinets w/solid surface counter | **20** | LF | $715.00 | $14,300 |
| 461 | tackable surface backsplash | **160** | SF | $24.00 | $3,840 |
| 462 | **06 20 00 Finish Carpentry Total** | | | | **$1,692,555** |
| 463 | | | | | |
| 464 | **06 40 00 Architectural Woodwork** | | | | |
| 465 | Perforated arch grille curved @ Classrooms 1' h | **1,345** | LF | $55.00 | $73,975 |
| 466 | Wood cantelevered benches at classroom glazed partitions | **42** | EA | $350.00 | $14,700 |
| 467 | **06 40 00 Architectural Woodwork Total** | | | | **$88,675** |
| 468 | | | | | |
| 469 | | | | | |
| 470 | **07-THERMAL AND MOISTURE PROTECTION** | | | | |
| 471 | | | | | |
| 472 | **07 00 01* Waterproofing, Dampproofing & Caulking** | | | | |
| 473 | ***07 11 00 Bituminous Dampproofing*** | | | | |
| 474 | ***07 13 00 Self-Adhering Waterproofing*** | | | | |
| 475 | ***07 16 00 Cementitious Waterproofing*** | | | | |
| 476 | ***07 27 00 Air Barrier*** | | | | |
| 477 | ***07 92 00 Joint Sealants*** | | | | |
| 478 | 2" rigid insulation to perimeter of slab | **6,392** | SF | $2.65 | BP#2 |
| 479 | Vapor retarder under slab | **76,145** | SF | $1.00 | BP#2 |
| 480 | Fluid applied air vapor barrier | **24,140** | SF | $6.50 | $156,910 |
| 481 | Fluid applied air vapor barrier | **17,333** | SF | $6.50 | $112,665 |
| 482 | Fluid applied air vapor barrier | **4,578** | SF | $6.50 | $29,757 |
| 483 | Fluid applied air vapor barrier | **3,638** | SF | $6.50 | $23,647 |
| 484 | Fluid applied air vapor barrier | **6,581** | SF | $6.50 | $42,777 |
| 485 | Caulking and sealants at corrugated metal panel | **4,578** | SF | $0.65 | $2,976 |
| 486 | Caulking and sealants at composite metal panel | **3,638** | SF | $0.65 | $2,365 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 487 | Caulking and sealants at Trespa cladding | **6,581** | SF | $0.65 | $4,278 |
| 488 | Caulking and sealants at brick & CMU | **41,473** | SF | $0.65 | $26,957 |
| 489 | Window caulking | **7,906** | LF | $3.00 | $23,718 |
| 490 | Waterproofing elevator pit | **225** | SF | $18.00 | $4,050 |
| 491 | Damp proofing to foundation walls | **10,195** | SF | $4.50 | $45,879 |
| 492 | **07 00 01* Waterproofing, Dampproofing & Caulking Total** | | | | **$475,977** |
| 493 | | | | | |
| 494 | **07 00 02* Roofing & Flashing** | | | | |
| 495 | ***07 54 00 Thermoplastic Membrane Roofing*** | | | | |
| 496 | ***07 62 00 Sheet Metal Flashing and Trim*** | | | | |
| 497 | ***07 72 00 Roof Accessories*** | | | | |
| 498 | Single-ply PVC membrane roofing system | **65,518** | SF | | |
| 499 | Type 1; Main roof, lower roof | **36,386** | SF | $13.25 | $482,115 |
| 500 | Type 2; Gym | **8,955** | SF | $13.25 | $118,654 |
| 501 | Type 3; Raised roof above Learning Commons | **8,610** | SF | $13.25 | $114,083 |
| 502 | Type 4; Entry walkway & Terrace | **1,216** | SF | $13.25 | $16,105 |
| 503 | Type 5; Auditorium | **7,615** | SF | $13.25 | $100,899 |
| 504 | Vertical roof membrane, 5'-6" h at raised roof | **2,736** | SF | $14.25 | $38,988 |
| 505 | ½" roof cover board | **65,518** | SF | $2.25 | $147,414 |
| 506 | 6" insulation | **64,302** | SF | $2.50 | $160,755 |
| 507 | Vapor retarder | **65,518** | SF | $1.50 | $98,276 |
| 508 | Add ½"fire rated roof board @ Auditorium, Gym & raised roof are | **17,565** | SF | $2.75 | $48,304 |
| 509 | Add 2 layers ½"fiber cement roof board @ Auditorium | **7,615** | SF | $5.00 | $38,075 |
| 510 | Add acoustic insulation in flutes @ Auditorium & Gym roof deck | **16,570** | SF | $1.50 | $24,855 |
| 511 | Precast concrete pavers over adjustable deck pedestal system @ r | **1,216** | SF | $45.00 | $54,698 |
| 512 | Glass canopy | **82** | SF | $150.00 | ($58,000) |
| 513 | Prefinished aluminum fascia/roof edge | **3,054** | LF | $50.00 | $152,700 |
| 514 | Roof expansion joint | **1** | AL | $15,000.00 | $15,000 |
| 515 | | | | | |
| 516 | *Roofing Accessories* | | | | |
| 517 | Roof hatch | **2** | EA | $3,000.00 | $6,000 |
| 518 | Paver walkway | **745** | SF | $25.00 | $18,625 |
| 519 | **07 00 02* Roofing & Flashing Total** | | | | **$1,577,545** |
| 520 | | | | | |
| 521 | **07 42 00 Wall Panels** | | | | |
| 522 | **07 42 10 Aluminum Composite Metal Panels** | | | | |
| 523 | Corrugated metal panel w/exposed fasteners | **4,578** | SF | $50.00 | $228,900 |
| 524 | 5" Fiberglass thermal Z-furring | **4,578** | SF | $3.50 | $16,023 |
| 525 | Corrugated perforated metal; mechanical RTU screen | **1,678** | SF | $50.00 | $83,900 |
| 526 | Composite metal panel w/exposed fasteners | **3,638** | SF | $75.00 | $272,850 |
| 527 | 5" Fiberglass thermal Z-furring | **3,638** | SF | $3.50 | $12,733 |
| 528 | | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 529 | Wood grain phenolic panel - Trespa @ ext wall incl's projections/ | **6,581** | SF | $82.00 | $539,642 |
| 530 | 5" Fiberglass thermal Z-furring | **6,581** | SF | $3.50 | $23,034 |
| 531 | | | | | |
| 532 | Phenolic panel; Ext soffit at projection/window bay | **1,250** | SF | $82.00 | $102,500 |
| 533 | Furring | **1,250** | SF | $4.25 | $5,313 |
| 534 | 4" mineral fiber insulation at Trespa cladding - Exterior soffit | **1,250** | SF | $4.00 | $5,000 |
| 535 | **07 42 00 Wall Panels Total** | | | | **$1,289,894** |
| 536 | | | | | |
| 537 | **07 81 00 Applied Fireproofing** | | | | |
| 538 | Spray fireproofing | **135,000** | SF | $2.30 | $310,500 |
| 539 | Intumescent fireproofing | **1** | LS | $85,000.00 | $85,000 |
| 540 | **07 81 00 Applied Fireproofing Total** | | | | **$395,500** |
| 541 | | | | | |
| 542 | **07 84 10 Penetration Firestopping** | | | | |
| 543 | See 09 | | | | |
| 544 | **07 84 10 Penetration Firestopping Total** | | | | |
| 545 | | | | | |
| 546 | | | | | |
| 547 | **08-OPENINGS** | | | | |
| 548 | | | | | |
| 549 | **08 11 10 Hollow Metal Doors and Frames** | | | | |
| 550 | Security gate 7'-0" x 7'-10", steel @ 1st Floor Corridors | **2** | EA | $975.00 | $1,950 |
| 551 | Hollow Metal Doors: | | | | |
| 552 | type B1, single | **41** | EA | $325.00 | $13,325 |
| 553 | type B2, pair | **6** | EA | $650.00 | $3,900 |
| 554 | HM frames | **260** | EA | $225.00 | $58,500 |
| 555 | HM frames for pair doors | **29** | EA | $275.00 | $7,975 |
| 556 | Wood Doors: | | | | |
| 557 | type B1, single, wood | **91** | EA | $325.00 | $29,575 |
| 558 | same as above w/applied surface both sides | **13** | EA | $775.00 | $10,075 |
| 559 | type B1, 5'-0" x 26'-0" swinging panel @ AV rooms | **2** | EA | $25,000.00 | $50,000 |
| 560 | type B2, pair, wood | **13** | EA | $650.00 | $8,450 |
| 561 | type C1, single, wood w/full height glass | **111** | EA | $400.00 | $44,400 |
| 562 | type C2, pair, w/full height glass | **9** | EA | $800.00 | $7,200 |
| 563 | type C3, pair, w/vision panel 0'-5" x 6'-0" | **1** | EA | $800.00 | $800 |
| 564 | | | | | |
| 565 | Exterior HM doors; complete | **45** | LEAF | | |
| 566 | Type A, single | **1** | LEAF | $1,800.00 | $1,800 |
| 567 | Type B1, single | **5** | LEAF | $1,800.00 | $9,000 |
| 568 | Type B2, pair | **9** | PR | $3,600.00 | $32,400 |
| 569 | Type B2, 10'-0" x 8'-6" @ Receiving | **1** | PR | $5,000.00 | $5,000 |
| 570 | **08 11 10 Hollow Metal Doors and Frames Total** | | | | **$284,350** |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 571 | | | | | |
| 572 | **08 14 00 Flush Wood Doors** | | | | |
| 573 | **08 34 70 Interior Sound Control Door Assemblies** | | | | |
| 574 | *Premium cost for acoustical doors* | **40** | LOC | $250.00 | $10,000 |
| 575 | **08 14 00 Flush Wood Doors Total** | | | | **$10,000** |
| 576 | | | | | |
| 577 | **08 31 10 Access Doors & Frames** | | | | |
| 578 | Access doors | **100** | EA | $300.00 | $30,000 |
| 579 | **08 31 10 Access Doors & Frames Total** | | | | **$30,000** |
| 580 | | | | | |
| 581 | **08 33 10 Overhead Coiling Doors** | | | | |
| 582 | **08 33 10 Overhead Coiling Grilles** | | | | |
| 583 | *Coiling drapery, security screen* | | | | |
| 584 | *Cafeteria/Learning Commons; 21'-0" x 8'-0" (2 ea)* | **336** | SF | $55.00 | $18,480 |
| 585 | *Kitchen; 40'-0" x 8'-0" (1 ea)* | **320** | SF | $55.00 | $17,600 |
| 586 | *Admin area; 21'-0" x 5'-6" (1 ea)* | **116** | SF | $55.00 | $6,353 |
| 587 | | | | | |
| 588 | *OH door, 12'-0" x 10'-6" motor operated @ Makerspace* | **1** | EA | $8,000.00 | $8,000 |
| 589 | **08 33 10 Overhead Coiling Doors Total** | | | | **$50,433** |
| 590 | | | | | |
| 591 | **08 00 01* Metal Windows** | | | | |
| 592 | **08 41 10 Aluminum-Framed Entrances and Storefronts** | | | | |
| 593 | **08 44 10 Glazed Aluminum Curtain Walls** | | | | |
| 594 | **08 45 23 Fiberglass-Sandwich-Panel Assemblies** | | | | |
| 595 | **08 51 10 Aluminum Windows** | | | | |
| 596 | Aluminum entry doors including hardware | **17** | LEAF | | |
| 597 | Type SF1, single | **7** | LEAF | $3,500.00 | $24,500 |
| 598 | Type SF2, pair | **5** | PR | $7,000.00 | $35,000 |
| 599 | School guard premium | **5** | LVS | $1,000.00 | $5,000 |
| 600 | | | | | |
| 601 | Aluminum-Framed Entrances and Storefronts, interior | | | | |
| 602 | type SF1, single, aluminum/glass | **3** | EA | $2,500.00 | $7,500 |
| 603 | type SF2, pair, aluminum/glass | **2** | PR | $5,000.00 | $10,000 |
| 604 | School guard doors, premium | **6** | LVS | $1,000.00 | $6,000 |
| 605 | | | | | |
| 606 | Aluminum storefronts, double glazed w/security insul glazing, sch | **919** | SF | | |
| 607 | Type 10A; 24'-8 1/4" x 12'-0" | **1** | EA | $32,800.00 | $32,800 |
| 608 | Type 11A; 9'-6 1/4" x 12'-0" | **1** | EA | $12,600.00 | $12,600 |
| 609 | Type 12A; 9'-7 1/2" x 12'-0" | **2** | EA | $11,100.00 | $22,200 |
| 610 | Type 13A; 7'-6" x 12'-0" | **1** | EA | $9,900.00 | $9,900 |
| 611 | Type 16A; 12'-0" x 13'-0 1/2" | **1** | EA | $17,200.00 | $17,200 |
| 612 | Bay windows | **2,912** | SF | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 613 | Type 1; 9'-3" x 12'-0" | **10** | EA | $11,700.00 | $117,000 |
| 614 | Type 2; 9'-3" x 12'-0" | **11** | EA | $11,700.00 | $128,700 |
| 615 | Type 2A; 9'-3" x 11'-0 1/4" | **2** | EA | $11,200.00 | $22,400 |
| 616 | Type 3; 9'-3" x 11'-6" | **9** | EA | $11,200.00 | $100,800 |
| 617 | Type 3C; 7'-0" x 12'-0" | **1** | EA | $8,900.00 | $8,900 |
| 618 | Curtain wall/Windows | **8,799** | SF | | |
| 619 | Type 4; 3'-0" x 10'-1" | **57** | EA | $3,000.00 | $171,000 |
| 620 | Type 5A; 3'-11" x 12'-0" | **6** | EA | $5,100.00 | $30,600 |
| 621 | Type 5B; 3'-11" x 11'-6" | **22** | EA | $5,100.00 | $112,200 |
| 622 | Type A1; 1'-4" x 3'-0" | **1** | EA | $400.00 | $400 |
| 623 | Type A2; 2'-0" x 4'-0" | **1** | EA | $900.00 | $900 |
| 624 | Type A3; 2'-0" x 12'-0" | **27** | EA | $2,300.00 | $62,100 |
| 625 | Type B1; 3'-4" x 12'-0" | **10** | EA | $3,800.00 | $38,000 |
| 626 | Type B1A; 3'-4" x 5'-10" | **2** | EA | $1,600.00 | $3,200 |
| 627 | Type B3; 3'-4" x 7'-0" | **1** | EA | $2,600.00 | $2,600 |
| 628 | Type B4; 3'-4" x 12'-0" | **9** | EA | $3,800.00 | $34,200 |
| 629 | Type C1; 3'-4" x 12'-0" | **14** | EA | $3,800.00 | $53,200 |
| 630 | Type D1; 5'-4" x 6'-2" | **2** | EA | $3,600.00 | $7,200 |
| 631 | Type D3; 5'-4" x 12'-0" | **12** | EA | $6,200.00 | $74,400 |
| 632 | Type E1; 5'-4" x 10'-0" | **3** | EA | $6,200.00 | $18,600 |
| 633 | Type E2; 5'-4" x 12'-0" | **6** | EA | $6,200.00 | $37,200 |
| 634 | Type F1; 7'-4" x 6'-2" | **1** | EA | $5,000.00 | $5,000 |
| 635 | Type F2; 7'-4" x 10'-0" | **3** | EA | $8,100.00 | $24,300 |
| 636 | Type F3; 7'-4" x 12'-0" | **7** | EA | $8,500.00 | $59,500 |
| 637 | Type G1; 7'-4" x 12'-0" | **11** | EA | $8,500.00 | $93,500 |
| 638 | Type H1; 9'-4" x 6'-0" | **1** | EA | $6,200.00 | $6,200 |
| 639 | Type H2; 9'-4" x 10'-0" | **1** | EA | $10,800.00 | $10,800 |
| 640 | Type H3; 9'-4" x 12'-0" | **1** | EA | $12,300.00 | $12,300 |
| 641 | Type I1; 9'-4" x 6'-0" | **1** | EA | $6,200.00 | $6,200 |
| 642 | Type I2; 9'-4" x 10'-0" | **1** | EA | $10,800.00 | $10,800 |
| 643 | Type I3; 9'-4" x 12'-0" | **1** | EA | $10,800.00 | $10,800 |
| 644 | Type K1; 11'-4" x 12'-0" | **2** | EA | $15,000.00 | $30,000 |
| 645 | Type L1; 13'-4" x 12'-0" | **1** | EA | $15,400.00 | $15,400 |
| 646 | Type M1; 10'-4" x 6'-2" | **1** | EA | $7,000.00 | $7,000 |
| 647 | Type N1; 6'-4" x 4'-4" | **2** | EA | $3,100.00 | $6,200 |
| 648 | Type N2; 6'-4" x 5'-10" | **2** | EA | $4,100.00 | $8,200 |
| 649 | Type O1; 6'-4" x 12'-0" | **2** | EA | $8,400.00 | $16,800 |
| 650 | Type Q1; 4'-4" x 7'-0" | **1** | EA | $3,300.00 | $3,300 |
| 651 | Type R1; 3'-4" x 6'-11" irregular shape | **1** | EA | $2,500.00 | $2,500 |
| 652 | Bandshell (windows only) | **1** | AL | $80,000.00 | $80,000 |
| 653 | | | | | |
| 654 | Glazed aluminum-framed skylight | **4,015** | SF | $150.00 | $602,250 |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 655 | | | | | |
| 656 | *Interior storefront* | | | | |
| 657 | Storefront @ vestibule | **3,115** | SF | $85.00 | $264,775 |
| 658 | | | | | |
| 659 | **08 00 01* Metal Windows Total** | | | | **$2,482,125** |
| 660 | | | | | |
| 661 | **08 63 00 Metal-Framed Skylights** | | | | |
| 662 | See 08 00 01 | | | | |
| 663 | **08 63 00 Metal-Framed Skylights Total** | | | | |
| 664 | | | | | |
| 665 | **08 71 00 Door Hardware** | | | | |
| 666 | *Interior:* | | | | |
| 667 | Hardware | **318** | SET | $750.00 | $238,500 |
| 668 | Powered door openers | **4** | LOC | $3,500.00 | $14,000 |
| 669 | CR; Card reader | **15** | EA | $3,000.00 | $45,000 |
| 670 | RDL; Remote door un/lock | **14** | EA | $3,000.00 | $42,000 |
| 671 | | | | | |
| 672 | Exterior: | | | | |
| 673 | Card reader | **3** | EA | $3,500.00 | $10,500 |
| 674 | RDL; Remote door un/lock | **16** | EA | $3,500.00 | $56,000 |
| 675 | **08 71 00 Door Hardware Total** | | | | **$406,000** |
| 676 | | | | | |
| 677 | **08 00 02* Glass and Glazing** | | | | |
| 678 | **08 80 00 Glazing** | | | | |
| 679 | Door sidelights | **900** | SF | $65.00 | $58,500 |
| 680 | Glazing to doors | **1,554** | SF | $65.00 | $101,010 |
| 681 | | | | | |
| 682 | Interior windows | | | | |
| 683 | Interior | **5,215** | SF | $65.00 | $338,975 |
| 684 | Glazed film | **4,332** | SF | $5.00 | $21,660 |
| 685 | Ballistic glass sliding window @ Admin | **1** | EA | $2,500.00 | $2,500 |
| 686 | Mirror frameless | **1,454** | SF | $45.00 | $65,430 |
| 687 | Graduated glass; premium | **2,359** | SF | $50.00 | $117,950 |
| 688 | Acoustical glass premium | **505** | SF | $100.00 | $50,500 |
| 689 | Breakout Space-A, B & C; Glazed | **2,300** | SF | $100.00 | $230,000 |
| 690 | **08 00 02* Glass and Glazing Total** | | | | **$986,525** |
| 691 | | | | | |
| 692 | **08 90 00 Louvers and Vents** | | | | |
| 693 | Metal louver | **625** | SF | $85.00 | $53,125 |
| 694 | **08 90 00 Louvers and Vents Total** | | | | **$53,125** |
| 695 | | | | | |
| 696 | | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 697 | **09-FINISHES** | | | | |
| 698 | | | | | |
| 699 | **09 29 00 Gypsum Drywall** | | | | |
| 700 | **06 10 00 Rough Carpentry** | | | | |
| 701 | Furnishings; miscellaneous wood blocking | **137,385** | GSF | $0.25 | $34,346 |
| 702 | Blocking at doors | **5,406** | LF | $5.00 | $27,030 |
| 703 | Door Installation | **318** | EA | $200.00 | $63,600 |
| 704 | Rough carpentry internal partitions and ceilings | **137,385** | GSF | $1.50 | $206,078 |
| 705 | Blocking for openings | **7,906** | LF | $8.00 | $63,248 |
| 706 | Rough carpentry/wood blocking to roof | **5,138** | LF | $10.00 | $51,380 |
| 707 | | | | | |
| 708 | Firestopping | **137,385** | GSF | $0.30 | $41,216 |
| 709 | Interior penetration firestopping | | | | |
| 710 | Top-of-partition firestopping | **137,385** | GSF | $1.50 | $206,078 |
| 711 | | | | | |
| 712 | 3" Faced rigid cellular polyiso insulation | **17,333** | SF | $4.00 | $69,332 |
| 713 | 3" Faced rigid cellular polyiso insulation | **24,140** | SF | $4.00 | $96,560 |
| 714 | 4" Mineral fiber insulation | **4,578** | SF | $4.50 | $20,601 |
| 715 | 4" Mineral fiber insulation | **3,638** | SF | $4.50 | $16,371 |
| 716 | 4" Mineral fiber insulation at Trespa cladding - | **6,581** | SF | $4.50 | $29,615 |
| 717 | 6" insulation | **64,302** | SF | $2.50 | $160,755 |
| 718 | | | | | |
| 719 | *Gypsum board partitions* | ***114,616*** | *SF* | | |
| 720 | Type B3; 3 5/8" metal stud, 5/8" GWB | **203** | SF | $8.75 | $1,776 |
| 721 | Type B4; same as type B3, add batt insulation | **5,145** | SF | $10.25 | $52,736 |
| 722 | Type C2; 3 5/8" metal stud, 2x 5/8" GWB | **5,600** | SF | $11.00 | $61,600 |
| 723 | Type C3; 3 5/8" metal stud, 2x 5/8" GWB, batt insulation | **6,483** | SF | $12.50 | $81,038 |
| 724 | Type C4; same as type C3, add 1hr fire rated | **3,165** | SF | $13.00 | $41,145 |
| 725 | Type C6; 6" metal stud, 2x 5/8" GWB, batt insulation | **2,468** | SF | $14.50 | $35,786 |
| 726 | Type C7; same as type C6, add 1hr fire rated | **5,507** | SF | $15.00 | $82,605 |
| 727 | Type C8; 8" metal stud, 2x 5/8" GWB, batt insulation | **172** | SF | $17.50 | $3,010 |
| 728 | Type C10; 10" metal stud, 2x 5/8" GWB, batt insulation | **222** | SF | $19.50 | $4,329 |
| 729 | Type D3; 3 5/8" metal stud, 2x 5/8" GWB, batt insulation | **1,526** | SF | $12.50 | $19,075 |
| 730 | Type D6; 6" metal stud, 2x 5/8" GWB, batt insulation | **1,266** | SF | $14.50 | $18,357 |
| 731 | Type E3; 3 5/8" metal stud, 3x 5/8" GWB, batt insulation | **23,327** | SF | $14.75 | $344,073 |
| 732 | Type E4; same as type E3, add 1hr fire rated | **780** | SF | $15.75 | $12,285 |
| 733 | Type E6; 6" metal stud, 3x 5/8" GWB, batt insulation | **1,158** | SF | $17.00 | $19,686 |
| 734 | Type E7; 10" metal stud, 3x 5/8" GWB, batt insulation | **1,022** | SF | $21.00 | $21,462 |
| 735 | Type E8; 8" metal stud, 3x 5/8" GWB, batt insulation | **18,060** | SF | $19.00 | $343,140 |
| 736 | Type E9; same as type E8, add 1hr fire rated | **2,710** | SF | $19.50 | $52,845 |
| 737 | Type F1; 3 5/8" metal stud, 4x 5/8" GWB, batt insulation | **4,988** | SF | $16.95 | $84,547 |
| 738 | Type F2; same as type F1, add 1hr fire rated | **1,834** | SF | $17.95 | $32,920 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 739 | Type F6; 6" metal stud, 4x 5/8" GWB, batt insulation | **9,646** | SF | $18.95 | $182,792 |
| 740 | Type F7; 8" metal stud, 4x 5/8" GWB, batt insulation | **227** | SF | $20.95 | $4,756 |
| 741 | Type F8; same as type F7, add 1hr fire rated | **1,065** | SF | $21.45 | $22,844 |
| 742 | Type H4; 4" metal C-H stud, 3x 5/8" GWB, batt insulation, 2hr rate | **67** | SF | $17.25 | $1,156 |
| 743 | Type H6; 6" metal C-H stud, 3x 5/8" GWB, batt insulation, 2hr rate | **1,561** | SF | $19.25 | $30,049 |
| 744 | Type J1; 2 x (3 5/8" metal stud, 5/8" GWB, batt insulation) | **6,552** | SF | $20.50 | $134,316 |
| 745 | Type J2; same as type J1 | **1,157** | SF | $20.50 | $23,719 |
| 746 | Type K1; 2 x (3 5/8" metal stud, 2x5/8" GWB, batt insulation) | **6,245** | SF | $25.00 | $156,125 |
| 747 | Type K2; same as typeK1, add 1hr fire rated | **2,460** | SF | $25.50 | $62,730 |
| 748 | | | | | |
| 749 | | | | | |
| 750 | Breakout framing | **15,812** | SF | $28.00 | $442,736 |
| 751 | | | | | |
| 752 | Roof soffit/fascia framing | **500** | LF | $165.00 | $82,500 |
| 753 | ½" Fiberglass faced gypsum sheathing | **26,668** | SF | $2.00 | $53,336 |
| 754 | 10" Cold formed metal framing | **26,668** | SF | $15.00 | $400,020 |
| 755 | ⅝" GWB interior of exterior wall | **26,668** | SF | $2.50 | $66,670 |
| 756 | | | | | |
| 757 | ½" Fiberglass faced gypsum sheathing | **4,578** | SF | $2.00 | $9,156 |
| 758 | 10" Cold formed metal framing | **4,578** | SF | $15.00 | $68,670 |
| 759 | ⅝" GWB interior of exterior wall | **4,578** | SF | $2.50 | $11,445 |
| 760 | | | | | |
| 761 | ½" Fiberglass faced gypsum sheathing | **3,638** | SF | $2.00 | $7,276 |
| 762 | 10" Cold formed metal framing | **3,638** | SF | $15.00 | $54,570 |
| 763 | ⅝" GWB interior of exterior wall | **3,638** | SF | $2.50 | $9,095 |
| 764 | | | | | |
| 765 | ½" Fiberglass faced gypsum sheathing | **6,581** | SF | $2.00 | $13,162 |
| 766 | 10" Cold formed metal framing | **6,581** | SF | $15.00 | $98,715 |
| 767 | ⅝" GWB interior of exterior wall | **6,581** | SF | $2.50 | $16,453 |
| 768 | | | | | |
| 769 | 1/2" sheathing at Trespa cladding - Exterior soffit | **1,250** | SF | $15.00 | $18,750 |
| 770 | 6" Metal stud at Trespa cladding - Exterior soffit | **1,250** | SF | $16.00 | $20,000 |
| 771 | 5/8 GWB at Trespa cladding - Exterior soffit | **1,250** | SF | $15.00 | $18,750 |
| 772 | | | | | |
| 773 | Mockup | **1** | AL | $25,000.00 | $25,000 |
| 774 | GWB soffit, light cove | **1,320** | LF | $35.00 | $46,200 |
| 775 | Shadow relief | **125** | LF | $1,200.00 | $150,000 |
| 776 | GWB ceiling/soffit in classrooms | **16,127** | SF | $32.00 | $516,064 |
| 777 | Sloped GWB soffit @ Art. | **175** | SF | $18.00 | $3,150 |
| 778 | Suspended plam clouds | **4,950** | SF | $55.00 | $272,250 |
| 779 | Premium for resilient ceiling | **5,500** | SF | $5.00 | $27,500 |
| 780 | Gym ceiling; suspended lay in pre painted tegular edge tectum pla | **2,101** | SF | $18.00 | $37,823 |

# *Fuller Middle School*

Framingham, MA

137,385 GSF

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 781 | B1; GWB ceiling @ Atrium | **6,402** | SF | $22.00 | $140,844 |
| 782 | **09 29 00 Gypsum Drywall Total** | | | | **$5,627,244** |
| 783 | | | | | |
| 784 | **09 30 00* Tiling** | | | | |
| 785 | Quarry tile at Kitchen | **1,705** | SF | $25.00 | $42,625 |
| 786 | Porcelain tile flooring | **5,500** | SF | $35.00 | $192,500 |
| 787 | Tile base | **2,235** | LF | $18.00 | $40,230 |
| 788 | Threshold | **1** | LS | $10,000.00 | $10,000 |
| 789 | Wall tile | **1,701** | SF | $22.00 | $37,422 |
| 790 | **09 30 00* Tiling Total** | | | | **$322,777** |
| 791 | | | | | |
| 792 | **09 50 01* Acoustical Ceilings** | | | | |
| 793 | ***09 51 10 Cementitious Wood Fiber Ceiling Panel*** | | | | |
| 794 | ***09 51 13 Acoustical Panel Ceilings*** | | | | |
| 795 | ***09 51 33 Metal Ceiling System*** | | | | |
| 796 | ACT ceilings at Corridors, Public, Admin areas, Teacher Pl | **51,004** | SF | $5.00 | $255,020 |
| 797 | ACT ceiling, washable in kitchen | **1,705** | SF | $5.25 | $8,951 |
| 798 | Circulation Corridors ceiling | **12,581** | SF | $32.00 | $402,592 |
| 799 | A1; ACT - MR ceiling at Toilets | **6,869** | SF | $5.75 | $39,498 |
| 800 | Lay in ACT ceiling at band/chorus | **4,550** | SF | $5.00 | $22,750 |
| | Deduct for alt | -1 | AL | 40000 | -40000 |
| 801 | Staging | **1** | LS | $75,000.00 | $75,000 |
| 802 | **09 50 01* Acoustical Ceilings Total** | | | | **$763,811** |
| 803 | | | | | |
| 804 | **09 60 01* Resilient Flooring** | | | | |
| 805 | ***09 65 00 Resilient Floor Tile*** | | | | |
| 806 | ***09 65 13 Resilient Wall Base & Accessories*** | | | | |
| 807 | ***09 65 66 Resilient Athletic Flooring*** | | | | |
| 808 | Linoleum treads & risers with rubber nosing | **828** | LFR | $15.50 | $12,834 |
| 809 | Linoleum tile at landings | **1,717** | SF | $8.00 | $13,736 |
| 810 | Acoustic underlayment under resilient flooring | **36,505** | SF | $4.00 | $146,020 |
| 811 | LT; Linoleum tile flooring, 13" x 13" | **73,152** | SF | $7.00 | $512,064 |
| 812 | LP; Plank linoleum flooring | **1,100** | SF | $12.00 | $13,200 |
| 813 | | | | | |
| 814 | Linoleum base | **12,630** | LF | $7.00 | $88,410 |
| 815 | | | | | |
| 816 | Vented rubber wall base | **375** | LF | $3.00 | $1,125 |
| 817 | **09 60 01* Resilient Flooring Total** | | | | **$787,389** |
| 818 | | | | | |
| 819 | **09 64 00 Wood Flooring** | | | | |
| 820 | Stage wood flooring: 4" hardboard assembly- recessed: | **1,590** | SF | $30.50 | $48,495 |
| 821 | 1/4" double tempered smooth both sides hardboard | | | | |

**BUILDING DETAILS - CSI**

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 822 | (2) layers 3/4" plywood on sleepers with insulation | | | | |
| 823 | **09 64 00 Wood Flooring Total** | | | | **$48,495** |
| 824 | | | | | |
| 825 | **09 64 40 Wood Athletic Flooring** | | | | |
| 826 | Wood athletic flooring at Gym | **8,405** | SF | $25.00 | $210,125 |
| 827 | **09 64 40 Wood Athletic Flooring Total** | | | | **$210,125** |
| 828 | | | | | |
| 829 | **09 67 23 Resinous Flooring** | | | | |
| 830 | EP; epoxy flooring at Toilets | **7,940** | SF | $15.00 | $119,100 |
| 831 | **09 67 23 Resinous Flooring Total** | | | | **$119,100** |
| 832 | | | | | |
| 833 | **09 68 00 Carpeting** | | | | |
| 834 | carpet at aisles | **2,770** | SF | $10.00 | $27,700 |
| 835 | **09 68 00 Carpeting Total** | | | | **$27,700** |
| 836 | | | | | |
| 837 | **09 72 00 Wall Coverings** | | | | |
| 838 | over curved gwb partition at curved wall | **3,156** | SF | $27.50 | $86,790 |
| 839 | Fabric wrapped acoustic wall panels @ Music areas | **1,443** | SF | $22.00 | $31,746 |
| 840 | sloped fabric wrapped acoustic panel | **8,359** | SF | $24.50 | $204,796 |
| 841 | Cementitious wood fiber acoustical wall panel @ Gym | **6,255** | SF | $20.00 | $125,100 |
| 842 | Mural panorama wall cover; angeled @ Media, Admin Install | | | | By Others |
| 843 | Wall pads with cutout for MEH units; allow | **1** | AL | $1,500.00 | $1,500 |
| 844 | **09 72 00 Wall Coverings Total** | | | | **$449,932** |
| 845 | | | | | |
| 846 | **09 91 00* Painting** | | | | |
| 847 | Painting | | | | |
| 848 | SC; sealed concrete at back of house | **23,200** | SF | $1.75 | $40,600 |
| 849 | E1; Exposed deck, painted @ Classrooms | **24,380** | SF | $1.50 | $36,570 |
| 850 | Gym exposed deck, painted | **8,405** | SF | $2.00 | $16,810 |
| 851 | Paint | **137,385** | GSF | $0.75 | $103,039 |
| 852 | Paint GWB ceilings w/high performance coating at Toilets | **30,893** | SF | $1.10 | $33,983 |
| 853 | Auditorium ceiling; painted exposed metal deck | **6,600** | SF | $2.50 | $16,500 |
| 854 | Epoxy paint wainscot @ Locker/Toilet | **8,234** | SF | $2.00 | $16,468 |
| 855 | Paint CMU wall | **12,492** | SF | $1.00 | $12,492 |
| 856 | Paint drywall partitions | **273,034** | SF | $0.85 | $232,079 |
| 857 | Paint door frames | **318** | EA | $85.00 | $27,030 |
| 858 | Paint door | **318** | EA | $65.00 | $20,670 |
| 859 | **09 91 00* Painting Total** | | | | **$556,240** |
| 860 | | | | | |
| 861 | | | | | |
| 862 | **10-SPECIALTIES** | | | | |
| 863 | | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 864 | | | | | |
| 865 | **10 00 01 Specialties** | | | | |
| 866 | Operable partitions | **5,440** | SF | $55.00 | $299,200 |
| 867 | **10 00 01 Specialties Total** | | | | **$299,200** |
| 868 | | | | | |
| 869 | **10 11 00 Visual Display Boards** | | | | |
| 870 | *Tackboards* | **2,688** | SF | $18.00 | $48,384 |
| 871 | *Markerboards* | **5,376** | SF | $25.00 | $134,400 |
| 872 | *Tackable wall; allow* | **3,000** | SF | $18.00 | $54,000 |
| 873 | | | | | |
| 874 | *Academic areas:* | | | | |
| 875 | *Magnetic writing surface* | **6,400** | SF | $22.00 | $140,800 |
| 876 | **10 11 00 Visual Display Boards Total** | | | | **$377,584** |
| 877 | | | | | |
| 878 | **10 14 23 Signage** | | | | |
| 879 | Signage | | | | |
| 880 | Commerative plaque | **2** | LOC | $1,500.00 | $3,000 |
| 881 | Dimensional characters; School name | **1** | AL | $5,000.00 | $5,000 |
| 882 | Plastic panel signs for room idenfication, way finding, hazard identification | **1** | AL | $7,500.00 | $7,500 |
| 883 | Framed paper signs | **1** | AL | $2,180.00 | $2,180 |
| 884 | Miscellaneous signage | **137,385** | GSF | $0.40 | $54,954 |
| 885 | **10 14 23 Signage Total** | | | | **$72,634** |
| 886 | | | | | |
| 887 | **10 21 13 Plastic Toilet Compartments** | | | | |
| 888 | Toilet compartments (plastic laminate) | | | | |
| 889 | Toilet compartments | **20** | EA | $1,200.00 | $24,000 |
| 890 | Toilet compartments - ADA | **14** | EA | $1,400.00 | $19,600 |
| 891 | Urinal screen | **20** | EA | $800.00 | $16,000 |
| 892 | **10 21 13 Plastic Toilet Compartments Total** | | | | **$59,600** |
| 893 | | | | | |
| 894 | **10 21 23 Cubicle Curtains, Tracks & Hardware** | | | | |
| 895 | Curtain track, carriers and curtains | **2** | EA | $200.00 | $400 |
| 896 | **10 21 23 Cubicle Curtains, Tracks & Hardware Total** | | | | **$400** |
| 897 | | | | | |
| 898 | **10 26 00 Wall Protection** | | | | |
| 899 | Wall & corner guards | | | | |
| 900 | Stainless steel corner guards | **1** | LS | $10,000.00 | $10,000 |
| 901 | **10 26 00 Wall Protection Total** | | | | **$10,000** |
| 902 | | | | | |
| 903 | **10 28 13 Toilet Accessories** | | | | |
| 904 | Toilet accessories | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 905 | Combination PTD/WR unit | **8** | EA | $150.00 | $1,200 |
| 906 | Towel dispenser/waste receptacle | **45** | EA | $100.00 | $4,500 |
| 907 | Soap dispensers | **45** | EA | $35.00 | $1,575 |
| 908 | Toilet paper dispensers | **48** | EA | $65.00 | $3,120 |
| 909 | Sanitary napkin disposal units | **21** | EA | $250.00 | $5,250 |
| 910 | Robe hook | **15** | EA | $25.00 | $375 |
| 911 | Fold-down shower seat | **1** | EA | $200.00 | $200 |
| 912 | Grab bars | **28** | PR | $160.00 | $4,480 |
| 913 | Mirrors - in private bathrooms | **14** | EA | $150.00 | $2,100 |
| 914 | Mop holder w/shelf (Janitors) | **6** | EA | $180.00 | $1,080 |
| 915 | **10 28 13 Toilet Accessories Total** | | | | **$23,880** |
| 916 | | | | | |
| 917 | **10 44 13 Fire Protection SpeciaLSies** | | | | |
| 918 | Fire extinguisher cabinets | | | | |
| 919 | Fully recessed/non-rated | **14** | EA | $450.00 | $6,182 |
| 920 | Semi-recessed/non-rated | **6** | EA | $300.00 | $1,800 |
| 921 | **10 44 13 Fire Protection SpeciaLSies Total** | | | | **$7,982** |
| 922 | | | | | |
| 923 | **10 51 24 Phenolic-Core Lockers** | | | | |
| 924 | Lockers | | | | |
| 925 | Athletic / PE lockers: metal 2-tier 30”h. x 15”w x 15”d | **50** | EA | $250.00 | $12,500 |
| 926 | Kitchen staff lockers, single tier, 12" x 12" x 6' high | **6** | EA | $250.00 | $1,500 |
| 927 | Student lockers 15"x12"x36" w/angled top, phenolic w/plam finis | **660** | EA | $600.00 | $396,000 |
| 928 | Benches | **500** | LF | $50.00 | $25,000 |
| 929 | **10 51 24 Phenolic-Core Lockers Total** | | | | **$435,000** |
| 930 | | | | | |
| 931 | | | | | |
| 932 | **11-EQUIPMENT** | | | | |
| 933 | | | | | |
| 934 | **11 00 00 Equipment** | | | | |
| 935 | Vocational allowance | **1** | LS | $100,000.00 | $100,000 |
| 936 | Loading dock equipment | **1** | LS | $10,000.00 | $10,000 |
| 937 | Fume hoods | **4** | EA | $10,000.00 | $40,000 |
| 938 | **11 00 00 Equipment Total** | | | | **$150,000** |
| 939 | | | | | |
| 940 | **11 31 00 Appliances** | | | | |
| 941 | Residential Appliances | | | | |
| 942 | Refrigerator/Freezer, microwave oven | **5** | RMS | $1,700.00 | $8,500 |
| 943 | Dishwasher | **1** | EA | $1,200.00 | $1,200 |
| 944 | Undercounter refrigerator @ Nurse | **1** | EA | $1,200.00 | $1,200 |
| 945 | **11 31 00 Appliances Total** | | | | **$10,900** |
| 946 | | | | | |

# *Fuller Middle School*

Framingham, MA

137,385 GSF

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 947 | **11 40 00 Food Service Equipment** | | | | |
| 948 | Food service equipment | | | | |
| 949 | Dining & Food Service (Budget provided, July 19, 2019) | **1** | AL | $415,270.00 | $415,270 |
| 950 | **11 40 00 Food Service Equipment Total** | | | | **$415,270** |
| 951 | | | | | |
| 952 | **11 52 13 Projection Screens** | | | | |
| 953 | Projection Screens | | | | |
| 954 | Motorized projection screen; Auditorium | **1** | EA | $17,000.00 | $17,000 |
| 955 | Projection screen - Media Center, room 1250 | **2** | EA | $3,000.00 | $6,000 |
| 956 | **11 52 13 Projection Screens Total** | | | | **$23,000** |
| 957 | | | | | |
| 958 | **11 61 00 Theater and Stage Equipment** | | | | |
| 959 | Auditorium/Theatre Equipment | | | | |
| 960 | AV | **1** | AL | $200,000.00 | $200,000 |
| 961 | Lighting | **1** | AL | $129,018.00 | $129,018 |
| 962 | Dimming | **1** | AL | $95,749.00 | $95,749 |
| 963 | Rigging | **1** | AL | $158,300.00 | $158,300 |
| 964 | Curtains | **1** | AL | $33,854.00 | $33,854 |
| 965 | Orchestra | **1** | AL | $175,000.00 | FF&E |
| 966 | Gym AV sound system | **1** | AL | $120,000.00 | $120,000 |
| 967 | Cafeteria AV | **1** | AL | $50,000.00 | $50,000 |
| 968 | Band and chorus AV | **1** | AL | $60,000.00 | $60,000 |
| 969 | Aud. seating; stacked (48), fixed (321), removeable (46) | **1** | AL | $106,445.00 | $106,445 |
| 970 | **11 61 00 Theater and Stage Equipment Total** | | | | **$953,366** |
| 971 | | | | | |
| 972 | **11 66 23 Gymnasium Equipment** | | | | |
| 973 | Gymnasium equipment | | | | |
| 974 | Shot clock/shot timer | **1** | EA | $1,250.00 | $1,250 |
| 975 | Pull up bar | **1** | EA | $850.00 | $850 |
| 976 | Stall bar | **1** | EA | $850.00 | $850 |
| 977 | Vertical ladder | **1** | EA | $550.00 | $550 |
| 978 | Rope hoist | **1** | EA | $500.00 | $500 |
| 979 | Overhead mounted folding backstops w/glass backboards | **6** | EA | $6,500.00 | $39,000 |
| 980 | Sleeves & floor plates for badminton & volleyball uprights; allow | **2** | SETS | $4,000.00 | $8,000 |
| 981 | Gym equipment controls-power touch | **1** | LS | $5,000.00 | $5,000 |
| 982 | Gym wall safety pads to be 8'-8" high | **2,634** | SF | $18.00 | $47,412 |
| 983 | **11 66 23 Gymnasium Equipment Total** | | | | **$103,412** |
| 984 | | | | | |
| 985 | **11 66 53 Gymnasium Dividers** | | | | |
| 986 | Gym motorized divider curtains | **1** | EA | $20,000.00 | $20,000 |
| 987 | **11 66 53 Gymnasium Dividers Total** | | | | **$20,000** |
| 988 | | | | | |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 989 | **11 66 80 Scoreboards** | | | | |
| 990 | Electronic scoreboard | **1** | EA | $7,500.00 | $7,500 |
| 991 | **11 66 80 Scoreboards Total** | | | | **$7,500** |
| 992 | | | | | |
| 993 | | | | | |
| 994 | **12-FURNISHING** | | | | |
| 995 | | | | | |
| 996 | **12 24 12 Roller Shades** | | | | |
| 997 | Window treatment, manually operated roller shades | **10,288** | SF | $6.00 | $61,728 |
| 998 | motorized roller shades @ exterior CW and SF | **1,456** | SF | $15.00 | $21,840 |
| 999 | motorized shade units at skylights | **4,015** | SF | $15.00 | $60,225 |
| 1000 | roller shade at interior doors w/lites & glazed partitions | **5,569** | SF | $6.00 | $33,414 |
| 1001 | **12 24 12 Roller Shades Total** | | | | **$177,207** |
| 1002 | | | | | |
| 1003 | **12 35 53 Caswork** | | | | |
| 1004 | Interior panel grille | **450** | LF | $150.00 | $67,500 |
| 1005 | (4) Adj shelves 12" wide melamine | **602** | LF | $140.00 | $84,280 |
| 1006 | (6) Adj shelves 12" wide melamine @ Media | **56** | LF | $210.00 | $11,760 |
| 1007 | | | | | |
| 1008 | Epoxy counter 24" wide | **325** | LF | $325.00 | $105,625 |
| 1009 | | | | | |
| 1010 | Mail slots, melamine | **16** | LF | $250.00 | $4,000 |
| 1011 | **12 35 53 Caswork Total** | | | | **$273,165** |
| 1012 | | | | | |
| 1013 | **12 48 13 Entrance Mats & Frames** | | | | |
| 1014 | *Entrance mats* | | | | |
| 1015 | RG; Vestibule | **396** | SF | $35.00 | $13,860 |
| 1016 | **12 48 13 Entrance Mats & Frames Total** | | | | **$13,860** |
| 1017 | | | | | |
| 1018 | **12 66 00 Telescoping Stands** | | | | |
| 1019 | Motorized telescoping bleachers, motorized | **760** | SEAT | $100.00 | $76,000 |
| 1020 | **12 66 00 Telescoping Stands Total** | | | | **$76,000** |
| 1021 | | | | | |
| 1022 | | | | | |
| 1023 | **13-SPECIAL CONSTRUCTION** | | | | |
| 1024 | | | | | |
| 1025 | **13 00 00 Special Construction** | | | | |
| 1026 | *No work in this section* | | | | |
| 1027 | **13 00 00 Special Construction Total** | | | | |
| 1028 | | | | | |
| 1029 | | | | | |
| 1030 | **14-CONVEYING EQUIPMENT** | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1031 | | | | | |
| 1032 | **14 24 00* Hydraulic Elevators** | | | | |
| 1033 | Elevators; 3,500#, 4 stops | **1** | EA | $215,000.00 | $215,000 |
| 1034 | **14 24 00* Hydraulic Elevators Total** | | | | **$215,000** |
| 1035 | | | | | |
| 1036 | | | | | |
| 1037 | **21 - 23-MECHANICAL** | | | | |
| 1038 | | | | | |
| 1039 | **21 00 00* Fire Protection** | | | | |
| 1040 | Upright Sprinkler Heads | **260** | EA | $390.00 | $101,400 |
| 1041 | Pendent Sprinkler Heads | **817** | EA | $415.00 | $339,055 |
| 1042 | Pendent/Upright Sprinkler Heads | **120** | EA | $510.00 | $61,200 |
| 1043 | Upright Sprinkler Heads ( Gym) | **70** | EA | $425.00 | $29,750 |
| 1044 | Upright Sprinkler Heads ( Auditorium) | **40** | EA | $425.00 | $17,000 |
| 1045 | Upright Sprinkler Heads ( Skylights) | **16** | EA | $440.00 | $7,040 |
| 1046 | Sidewall Sprinkler Heads | **121** | EA | $514.00 | $62,194 |
| 1047 | Window Sprinkler Heads | **22** | EA | $650.00 | $14,300 |
| 1048 | Dry Sprinkler Heads | **16** | EA | $495.00 | $7,920 |
| 1049 | Additional heads | **200** | EA | $495.00 | $99,000 |
| 1050 | 8" Water Service | **1** | EA | $6,250.00 | $6,250 |
| 1051 | 6" Alarm Valves w/ trim | **1** | EA | $5,560.00 | $5,560 |
| 1052 | 6" Backflow Preventer | **1** | EA | $8,500.00 | $8,500 |
| 1053 | Zone control w/ standpipe (SCVA) | **14** | EA | $3,650.00 | $51,100 |
| 1054 | 6" Riser Valves | **2** | EA | $950.00 | $1,900 |
| 1055 | 6" FSP W/ Standpipe | **5** | EA | $2,250.00 | $11,250 |
| 1056 | 4" FSP W/ Standpipe | **3** | EA | $2,045.00 | $6,135 |
| 1057 | Fire Dept. Connections | **1** | EA | $2,650.00 | $2,650 |
| 1058 | Riser Valve w/ tamper switch | **2** | EA | $750.00 | $1,500 |
| 1059 | Main piping: | | | | |
| 1060 | - 6" | **1,108** | LF | $80.00 | $88,640 |
| 1061 | Misc. Valves | **1** | LS | $4,500.00 | $4,500 |
| 1062 | Commissioning | **1** | LS | $1,250.00 | $1,250 |
| 1063 | Lifting | **1** | LS | $3,800.00 | $3,800 |
| 1064 | Testing | **1** | LS | $3,650.00 | $3,650 |
| 1065 | Coordination | **1** | LS | $8,100.00 | $8,100 |
| 1066 | Coring, Sleeves & sleeves | **1** | LS | $5,450.00 | $5,450 |
| 1067 | Seismic Restraints | **1** | LS | $5,900.00 | $5,900 |
| 1068 | Shop drawings/hydraulic calculations | **1** | LS | $8,000.00 | $8,000 |
| 1069 | **21 00 00* Fire Protection Total** | | | | **$962,994** |
| 1070 | | | | | |
| 1071 | **22 00 00* Plumbing** | | | | |
| 1072 | 6" Water Service w/ sub metera | **1** | EA | $9,500.00 | $9,500 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1073 | Hot Water Heater & Storage | | | | |
| 1074 | - WH-1 | **1** | EA | $65,000.00 | $65,000 |
| 1075 | - WH-2 | **1** | EA | $5,500.00 | $5,500 |
| 1076 | Mixing Valves | **1** | EA | $2,450.00 | $2,450 |
| 1077 | Circulating Pumps | **2** | EA | $1,050.00 | $2,100 |
| 1078 | Expansion Tank | **1** | EA | $2,200.00 | $2,200 |
| 1079 | 4" Backflow Preventers | **1** | EA | $5,560.00 | $5,560 |
| 1080 | Pressure Reducing Station | **1** | EA | $3,650.00 | $3,650 |
| 1081 | 1" Backflow Preventers | **2** | EA | $1,850.00 | $3,700 |
| 1082 | Grease Interceptor System 8,000 gal | **1** | EA | $48,500.00 | $48,500 |
| 1083 | Grease Trap | **1** | EA | $3,850.00 | $3,850 |
| 1084 | Oily Water Separator | **1** | EA | $4,580.00 | $4,580 |
| 1085 | Acid Neutralization Tank | **2** | EA | By Others | |
| 1086 | Condensate Pump: | | | | |
| 1087 | - CP-1 5 GPH | **1** | EA | $950.00 | $950 |
| 1088 | Heat Tracing | **1** | LS | $5,000.00 | $5,000 |
| 1089 | Elevator Sump Pump: | | | | |
| 1090 | - SP-1 | **1** | EA | $1,850.00 | $1,850 |
| 1091 | Reducer Pressure Backflow Preventer: | | | | |
| 1092 | - RBP-1 | **1** | EA | $2,500.00 | $2,500 |
| 1093 | Emergency Gas Shut Off Valve | **2** | EA | $1,250.00 | $2,500 |
| 1094 | Fixtures | | | | |
| 1095 | Water Closet P-1 | **20** | EA | $2,455.00 | $49,100 |
| 1096 | Water Closet P-1A | **31** | EA | $2,455.00 | $76,105 |
| 1097 | Urinal P-2 | **17** | EA | $2,510.00 | $42,670 |
| 1098 | Urinal P-2A | **8** | EA | $2,510.00 | $20,080 |
| 1099 | Lavatory P-3 | **49** | EA | $2,365.00 | $115,885 |
| 1100 | Lavatory P-3A | **28** | EA | $2,365.00 | $66,220 |
| 1101 | Drinking Fountain P-4 | **11** | EA | $3,250.00 | $35,750 |
| 1102 | Mop Sink P-5 | **5** | EA | $2,850.00 | $14,250 |
| 1103 | Shower P-6 | **2** | EA | $3,850.00 | $7,700 |
| 1104 | Science Room Sink P-7 | **40** | EA | $3,650.00 | $146,000 |
| 1105 | Science Room Sink P-7A | **2** | EA | $3,650.00 | $7,300 |
| 1106 | Classroom Sink P-8 | **7** | EA | $2,565.00 | $17,955 |
| 1107 | Art Sink P-9 | **3** | EA | $3,250.00 | $9,750 |
| 1108 | Art Sink P-9A | **1** | EA | $3,250.00 | $3,250 |
| 1109 | Eyewash/Shower P-10 | **5** | EA | $2,250.00 | $11,250 |
| 1110 | Fume Hood | **3** | EA | $5,000.00 | $15,000 |
| 1111 | Lab Equipment | **1** | LS | $25,000.00 | $25,000 |
| 1112 | labs & Consumer Science) | **36** | LS | $385.00 | $13,860 |
| 1113 | Floor Clean Outs: | | | | |
| 1114 | - FCO-1 | **54** | EA | $725.00 | $39,150 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1115 | Floor Drains: | | | | |
| 1116 | - 3" FD-A | **14** | EA | $1,050.00 | $14,700 |
| 1117 | - 3" FD-B | **8** | EA | $1,065.00 | $8,520 |
| 1118 | - 4" FD-B | **5** | EA | $1,165.00 | $5,825 |
| 1119 | Trap Primers | **16** | EA | $1,250.00 | $20,000 |
| 1120 | Roof Drain: | | | | |
| 1121 | - 8 RD-0 | **2** | EA | $1,650.00 | $3,300 |
| 1122 | - 6" RD-1 | **12** | EA | $1,410.00 | $16,920 |
| 1123 | - 5" RD-2 | **4** | EA | $1,220.00 | $4,880 |
| 1124 | - 4" RD-3 | **8** | EA | $1,010.00 | $8,080 |
| 1125 | Cup Sinks | **8** | EA | $1,850.00 | $14,800 |
| 1126 | Wall Hydrant | | | | |
| 1127 | - WHYD-1 | **18** | EA | $375.00 | $6,750 |
| 1128 | Hose Bibbs: | | | | |
| 1129 | - HB-1 | **12** | EA | $285.00 | $3,420 |
| 1130 | VTR | **9** | EA | $650.00 | $5,850 |
| 1131 | | | | | |
| 1132 | Storm piping, below grade: | | | | |
| 1133 | - 12" | **120** | LF | $125.00 | $15,000 |
| 1134 | - 8" | **50** | LF | $85.25 | $4,263 |
| 1135 | - 6" | **110** | LF | $62.55 | $6,881 |
| 1136 | - 4" | **40** | LF | $43.75 | $1,750 |
| 1137 | Storm piping, above grade: | | | | |
| 1138 | - 10" | **155** | LF | $110.00 | $17,050 |
| 1139 | - 8" | **510** | LF | $92.35 | $47,099 |
| 1140 | - 6" | **1,010** | LF | $65.05 | $65,701 |
| 1141 | - 4" | **165** | LF | $45.10 | $7,442 |
| 1142 | Waste and vent piping, below grade: | | | | |
| 1143 | - 5" | **650** | LF | $59.61 | $38,747 |
| 1144 | - 4" | **560** | LF | $43.75 | $24,500 |
| 1145 | - 3" | **265** | LF | $32.25 | $8,546 |
| 1146 | - 2" | **110** | LF | $26.85 | $2,954 |
| 1147 | Waste and vent piping, above grade: | | | | |
| 1148 | - 4" | **685** | LF | $43.10 | $29,524 |
| 1149 | - 3" | **785** | LF | $31.55 | $24,767 |
| 1150 | - 2" | **850** | LF | $26.25 | $22,313 |
| 1151 | Kitchen Waste Beloe grade: | | | | |
| 1152 | - 4" | **510** | LF | $32.00 | $16,320 |
| 1153 | - 3" | **40** | LF | $28.95 | $1,158 |
| 1154 | - 2" | **290** | LF | $22.50 | $6,525 |
| 1155 | Acid Waste below grade: | | | | |
| 1156 | - 4" | **425** | LF | $32.00 | $13,600 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1157 | - 2" | **290** | LF | $18.00 | $5,220 |
| 1158 | Acid Waste below grade: | | | | |
| 1159 | - 4" | **295** | LF | $32.00 | $9,440 |
| 1160 | - 3" | **210** | LF | $28.25 | $5,933 |
| 1161 | - 2" | **265** | LF | $18.00 | $4,770 |
| 1162 | Potable Water Piping: | | | | |
| 1163 | - 2-1/2" | **620** | LF | $48.95 | $30,349 |
| 1164 | - 2" | **780** | LF | $35.75 | $27,885 |
| 1165 | - 1-1/2 | **550** | LF | $30.45 | $16,748 |
| 1166 | - 1-1/4 | **475** | LF | $28.35 | $13,466 |
| 1167 | - Branch | **8,500** | LF | $25.75 | $218,875 |
| 1168 | Insulate Potable Water Piping: | | | | |
| 1169 | - 2-1/2" | **620** | LF | $16.40 | $10,168 |
| 1170 | - 2" | **780** | LF | $15.65 | $12,207 |
| 1171 | - 1-1/2 | **550** | LF | $14.75 | $8,113 |
| 1172 | - 1-1/4 | **475** | LF | $14.05 | $6,674 |
| 1173 | - Branch | **8,500** | LF | $13.75 | $116,875 |
| 1174 | Gas Piping | | | | |
| 1175 | - 6" | **50** | LF | $56.25 | $2,813 |
| 1176 | - 4" | **80** | LF | $48.95 | $3,916 |
| 1177 | - 3" | **120** | LF | $42.25 | $5,070 |
| 1178 | - Branch | **980** | LF | $29.65 | $29,057 |
| 1179 | Gas Hook-ups | **4** | EA | $850.00 | $3,400 |
| 1180 | Master Gas Valves | **2** | EA | $2,850.00 | $5,700 |
| 1181 | Pump | **1** | LS | $25,000.00 | $25,000 |
| 1182 | Flues to water heater | **120** | LF | $65.00 | $7,800 |
| 1183 | Generator Gas Connection | **1** | EA | $5,000.00 | $5,000 |
| 1184 | Kitchen | **1** | LS | $50,000.00 | $50,000 |
| 1185 | Storm Piping Insulation | **1** | LS | $25,000.00 | $25,000 |
| 1186 | Seismic Restraints | **1** | LS | $10,500.00 | $10,500 |
| 1187 | Lift & Hoisting | **1** | LS | $18,500.00 | $18,500 |
| 1188 | General Requirements | | | | |
| 1189 | Coring, cutting and sleeves | **1** | LS | $15,000.00 | $15,000 |
| 1190 | Commissioning | **1** | LS | $25,000.00 | $25,000 |
| 1191 | Valves and specialties | **1** | LS | $12,500.00 | $12,500 |
| 1192 | Permits & Fees | **1** | LS | $7,850.00 | $7,850 |
| 1193 | Test and sterilize | **1** | LS | $18,500.00 | $18,500 |
| 1194 | Shop drawings | **1** | LS | $16,500.00 | $16,500 |
| 1195 | **22 00 00* Plumbing Total** | | | | **$2,126,673** |
| 1196 | | | | | |
| 1197 | **23 00 00* HVAC** | | | | |
| 1198 | Boilers: | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1199 | - B-1 & 2 3,844 MBH | **2** | EA | $84,568.00 | $169,136 |
| 1200 | Expantion Tank: | | | | |
| 1201 | - ET-1 Thru 3 | **3** | EA | $2,150.00 | $6,450 |
| 1202 | Air Separator: | | | | |
| 1203 | - AS-1 & 2 8" | **2** | EA | $3,950.00 | $7,900 |
| 1204 | Buffer Tank: | | | | |
| 1205 | - BT-1 | **1** | EA | $2,500.00 | $2,500 |
| 1206 | Pumps: | | | | |
| 1207 | - P-1 & 2 HP 790 GPM | **2** | EA | $12,500.00 | $25,000 |
| 1208 | - P-3 & 4 HP 800 GPM | **2** | EA | | Pump House |
| 1209 | - BP-1 | **2** | EA | $2,500.00 | $5,000 |
| 1210 | - CP-1 5 GPH | **5** | EA | $450.00 | $2,250 |
| 1211 | Pumps House | **1** | EA | $185,000.00 | $185,000 |
| 1212 | | | | | |
| 1213 | Chillers: | | | | |
| 1214 | - CH-1 350 Ton | **1** | EA | $367,500.00 | $367,500 |
| 1215 | Rooftop Units: | | | | |
| 1216 | - RTU-1 22,000 CFM | **1** | EA | $264,000.00 | $264,000 |
| 1217 | - RTU-2 22,000 CFM | **1** | EA | $264,000.00 | $264,000 |
| 1218 | - RTU-3 22,000 CFM | **1** | EA | $264,000.00 | $264,000 |
| 1219 | - RTU-4 22,000 CFM | **1** | EA | $264,000.00 | $264,000 |
| 1220 | - RTU-5 15,000 CFM | **1** | EA | $180,000.00 | $180,000 |
| 1221 | - RTU-6 12,000 CFM | **1** | EA | $144,000.00 | $144,000 |
| 1222 | - RTU-7 2,000 CFM | **1** | EA | $28,000.00 | $28,000 |
| 1223 | Make Up Units: | | | | |
| 1224 | - MAU-1 5,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 1225 | Exhaust Fans: | | | | |
| 1226 | - EF-1 2,500 CFM | **1** | EA | $3,250.00 | $3,250 |
| 1227 | - EF-2 2,500 CFM | **1** | EA | $3,250.00 | $3,250 |
| 1228 | - EF-3 500 CFM | **1** | EA | $980.00 | $980 |
| 1229 | - EF-4 500 CFM | **1** | EA | $980.00 | $980 |
| 1230 | - EF-5 250 CFM | **1** | EA | $685.00 | $685 |
| 1231 | - EF-6 250 CFM | **1** | EA | $685.00 | $685 |
| 1232 | - SEF-1 50,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 1233 | - SEF-2 50,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 1234 | - SEF-3 50,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 1235 | - SEF-4 50,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 1236 | - KEF-1 4,170 CFM | **1** | EA | $4,500.00 | $4,500 |
| 1237 | - FEF-1 1,200 CFM | **1** | EA | $2,100.00 | $2,100 |
| 1238 | - FEF-2 1,200 CFM | **1** | EA | $2,100.00 | $2,100 |
| 1239 | - FEF-3 1,200 CFM | **1** | EA | $2,100.00 | $2,100 |
| 1240 | VAV Boxes: | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1241 | - VAV-8 | **150** | EA | $1,050.00 | $157,500 |
| 1242 | Radiant Heat Panels: | | | | |
| 1243 | - R1 | **2,525** | LF | $135.00 | $340,875 |
| 1244 | Fin-Tube Radiators: | | | | |
| 1245 | - FT-1 | **100** | LF | $90.00 | $9,000 |
| 1246 | Cabinet & Unit Heaters: | | | | |
| 1247 | - CUH-1,2, 7 thru 16 350 MBH | **12** | EA | $895.00 | $10,740 |
| 1248 | - CUH-3 1050 MBH | **1** | EA | $1,150.00 | $1,150 |
| 1249 | - CUH-4 thru 6 450 MBH | **3** | EA | $925.00 | $2,775 |
| 1250 | Ductless Split Units: | | | | |
| 1251 | - DCUe-1 1 Ton | **1** | EA | $2,950.00 | $2,950 |
| 1252 | - DCUe-2 2 Ton | **1** | EA | $4,425.00 | $4,425 |
| 1253 | - DCUe-3 2 Ton | **1** | EA | $4,425.00 | $4,425 |
| 1254 | - DCUe-4 1.5 Ton | **1** | EA | $3,850.00 | $3,850 |
| 1255 | - DCUe-5 1.5 Ton | **1** | EA | $3,850.00 | $3,850 |
| 1256 | - DCUe-6 1.5 Ton | **1** | EA | $3,850.00 | $3,850 |
| 1257 | - DCUe-7 1.5 Ton | **1** | EA | $3,850.00 | $3,850 |
| 1258 | Register & Diffusers: | | | | |
| 1259 | - DD-1 | **22** | EA | $985.00 | $21,670 |
| 1260 | - DD-2 | **18** | EA | $985.00 | $17,730 |
| 1261 | - DD-3 | **16** | EA | $985.00 | $15,760 |
| 1262 | - DD-4 | **1** | EA | $985.00 | $985 |
| 1263 | - DD-5 | **42** | EA | $985.00 | $41,370 |
| 1264 | - DD-6 | **2** | EA | $985.00 | $1,970 |
| 1265 | - DD-7 | **4** | EA | $985.00 | $3,940 |
| 1266 | - Slot | **750** | LF | $45.00 | $33,750 |
| 1267 | - E | **80** | EA | $225.00 | $18,000 |
| 1268 | Misc Diffusers, grills and registers | **1** | LS | $5,000.00 | $5,000 |
| 1269 | Fire & Motor Dampers | **30** | LS | $1,850.00 | $55,500 |
| 1270 | Volume Dampers | **1** | EA | $40,000.00 | $40,000 |
| 1271 | Flex Duct | **1** | LS | $30,000.00 | $30,000 |
| 1272 | Misc. Duct Accessories | **1** | LS | $25,000.00 | $25,000 |
| 1273 | Double Wall Galvanized Duct (Auditorium) | **8,500** | LBS | $20.25 | $172,125 |
| 1274 | Galvanized Duct | **130,000** | LBS | $12.50 | $1,625,000 |
| 1275 | Ductsox | **680** | LF | $45.00 | $30,600 |
| 1276 | Duct Insulation | **45,000** | SF | $4.65 | $209,250 |
| 1277 | Duct Insulation @ Kitchen area | **1** | LS | $35,000.00 | $35,000 |
| 1278 | Black iron at kitchen | **2,125** | LBS | $18.50 | $39,313 |
| 1279 | Duct S/S | **5,000** | LBS | $20.20 | $101,000 |
| 1280 | Seal Ductwork | **7,500** | LF | $1.60 | $12,000 |
| 1281 | Dust Collection System | **1** | LS | $25,000.00 | $25,000 |
| 1282 | Sound Attenuators | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1283 | - SA-1S | **1** | EA | $6,500.00 | $6,500 |
| 1284 | - SA-1R | **1** | EA | $6,500.00 | $6,500 |
| 1285 | - SA-2S | **1** | EA | $6,500.00 | $6,500 |
| 1286 | - SA-2R | **1** | EA | $6,500.00 | $6,500 |
| 1287 | - SA-3S | **1** | EA | $6,500.00 | $6,500 |
| 1288 | - SA-3R | **1** | EA | $6,500.00 | $6,500 |
| 1289 | - SA-4S | **1** | EA | $6,500.00 | $6,500 |
| 1290 | - SA-4R | **1** | EA | $6,500.00 | $6,500 |
| 1291 | - SA-5S | **1** | EA | $6,500.00 | $6,500 |
| 1292 | - SA-5R | **1** | EA | $6,500.00 | $6,500 |
| 1293 | - SA-6S | **1** | EA | $7,800.00 | $7,800 |
| 1294 | - SA-6R | **1** | EA | $6,200.00 | $6,200 |
| 1295 | - SA-7S | **1** | EA | $3,850.00 | $3,850 |
| 1296 | - SA-7R | **1** | EA | $3,850.00 | $3,850 |
| 1297 | - SA-8 | **1** | EA | $4,250.00 | $4,250 |
| 1298 | Hot & Chilles Water Piping | | | | |
| 1299 | - Large Bore | **9,000** | LF | $40.00 | $360,000 |
| 1300 | - Small Bore | **10,500** | LF | $28.00 | $294,000 |
| 1301 | Insulate Hot Water Piping | | | | |
| 1302 | - Large Bore | **9,000** | LF | $16.95 | $152,550 |
| 1303 | - Small Bore | **10,500** | LF | $12.50 | $131,250 |
| 1304 | Equipment Hook-Ups: | | | | |
| 1305 | - 4" Boilers | **2** | EA | $8,950.00 | $17,900 |
| 1306 | - 8" Pump | | EA | | Pump House |
| 1307 | - 4" Pump | **3** | EA | $2,100.00 | $6,300 |
| 1308 | - 8" Chiller | **1** | EA | $14,500.00 | $14,500 |
| 1309 | - RCP | **95** | EA | $1,075.00 | $102,125 |
| 1310 | - CUH | **12** | EA | $1,025.00 | $12,300 |
| 1311 | - FT | **2** | EA | $1,075.00 | $2,150 |
| 1312 | - DD | **105** | EA | $285.00 | $29,925 |
| 1313 | - VAV | **140** | EA | $1,105.00 | $154,700 |
| 1314 | - 4" RTU Coils | **6** | EA | $6,500.00 | $39,000 |
| 1315 | - 2" RTU Coils | **3** | EA | $2,650.00 | $7,950 |
| 1316 | VFD | **1** | LS | $20,000.00 | $20,000 |
| 1317 | Glycol: | | | | |
| 1318 | - GF-1 & 2 | **2** | EA | $6,500.00 | $13,000 |
| 1319 | Combustion | **1** | LS | $30,000.00 | $30,000 |
| 1320 | Flues S/S boiler | **380** | LF | $120.00 | $45,600 |
| 1321 | Seismic Restraints | **1** | LS | $10,500.00 | $10,500 |
| 1322 | Misc. Valves & specialties | **1** | LS | $15,000.00 | $15,000 |
| 1323 | Commissioning support | **1** | LS | $32,000.00 | $32,000 |
| 1324 | Controls | **1** | LS | $755,000.00 | $755,000 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1325 | Testing & Balancing | 1 | LS | $35,600.00 | $35,600 |
| 1326 | Rigging & Lifting | 1 | LS | $12,500.00 | $12,500 |
| 1327 | Permits & Fees | 1 | LS | $8,500.00 | $8,500 |
| 1328 | Shop Drawing | 1 | LS | $15,500.00 | $15,500 |
| 1329 | **23 00 00* HVAC Total** | | | | **$7,879,869** |
| 1330 | | | | | |
| 1331 | | | | | |
| 1332 | **26,27,28-ELECTRICAL, COMMUNICATION, SECURITY** | | | | |
| 1333 | | | | | |
| 1334 | **26 00 00* Electrical** | | | | |
| 1335 | ***27 00 00 Technology*** | | | | |
| 1336 | ***28 00 00 Integrated Electronic Security System*** | | | | |
| 1337 | Switchgear, Panelboards, Transformers | | | | |
| 1338 | 3000/2500 Amp Main Switchboard | 1 | LS | $110,739.20 | $110,739 |
| 1339 | Meter Pan | 1 | EA | $738.10 | $738 |
| 1340 | SPD @ Swbd | 1 | EA | $2,855.60 | $2,856 |
| 1341 | SPD @ Panelboard | 46 | EA | $1,113.20 | $51,207 |
| 1342 | 100 Amp Panel Board | 14 | EA | $4,048.66 | $56,681 |
| 1343 | 225 Amp Panel Board | 9 | EA | $6,749.38 | $60,744 |
| 1344 | 225 Amp Panel Board, 2-Section | 9 | EA | $11,521.62 | $103,695 |
| 1345 | 400 Amp Panel Board | 4 | EA | $9,571.10 | $38,284 |
| 1346 | 400 Amp Panel Board, 2-Section | 1 | EA | $16,443.90 | $16,444 |
| 1347 | 600 Amp Panel Board | 2 | EA | $13,013.55 | $26,027 |
| 1348 | 800 Amp Panel Board | 2 | EA | $16,577.00 | $33,154 |
| 1349 | 75 Kva Transformer | 1 | EA | $7,550.40 | $7,550 |
| 1350 | 225 Kva Transformer K13 | 3 | EA | $42,713.00 | $128,139 |
| 1351 | 800 Amp Disconnect @ Xfmr | 2 | EA | $7,381.00 | $14,762 |
| 1352 | Emergency Generator, UPS | | | | |
| 1353 | 350 Kw Emergency Generator, WP/Sound | 1 | LS | $147,862.00 | $147,862 |
| 1354 | Autotransfer Sw 150A | 1 | EA | $7,148.08 | $7,148 |
| 1355 | Autotransfer Sw 225A | 1 | EA | $10,145.85 | $10,146 |
| 1356 | Autotransfer Sw 400A | 1 | EA | $12,541.65 | $12,542 |
| 1357 | 150 Amp EG Quick Connect | 1 | EA | $3,049.20 | $3,049 |
| 1358 | 200/150 Amp Encl Ckt Brkr | 1 | EA | $1,923.90 | $1,924 |
| 1359 | 225 Amp Encl Ckt Brkr | 1 | EA | $3,693.53 | $3,694 |
| 1360 | 400 Amp Encl Ckt Brkr | 1 | EA | $4,283.40 | $4,283 |
| 1361 | 24KW/30Kva UPS, batteries | 2 | LS | $47,432.00 | $94,864 |
| 1362 | 200 Amp Disconnect @ UPS | 2 | EA | $1,923.90 | $3,848 |
| 1363 | Generator Annunciator | 1 | EA | $1,621.40 | $1,621 |
| 1364 | Motors: | | | | |
| 1365 | Cond Pump Conn | 12 | EA | $157.30 | $1,888 |
| 1366 | Install Limit Switch FBO | 3 | EA | $121.00 | $363 |
| 1367 | Install Misc Gym CP FBO | 8 | EA | $465.85 | $3,727 |
| 1368 | Motor Backbd Conn's, Swiitch | 8 | EA | $779.24 | $6,234 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1369 | Scoreboard Conn's, Switch | **1** | EA | $779.24 | $779 |
| 1370 | Bleach Motor 20/3A Conn, Switch | **7** | EA | $779.24 | $5,455 |
| 1371 | Manual Snap Switch Starter WP | **5** | EA | $338.80 | $1,694 |
| 1372 | 20/2 Amp Disconnect | **19** | EA | $444.07 | $8,437 |
| 1373 | 30/1 Amp Disconnect, Elev Cab | **1** | EA | $444.07 | $444 |
| 1374 | 30/2 Amp Disconnect, mech | **8** | EA | $584.43 | $4,675 |
| 1375 | 30 Amp Disconnect, mech,kit | **16** | EA | $779.24 | $12,468 |
| 1376 | 60 Amp Disconnect, mech, kit | **5** | EA | $1,333.42 | $6,667 |
| 1377 | 100 Amp Disconnect | **6** | EA | $1,452.00 | $8,712 |
| 1378 | 200 Amp Disconnect, Elev | **1** | EA | $2,214.30 | $2,214 |
| 1379 | 200/125 Amp Disconnect WP | **4** | EA | $2,214.30 | $8,857 |
| 1380 | 200/175 Amp Disconnect WP | **4** | EA | $2,214.30 | $8,857 |
| 1381 | 800 Amp Disconnect CH, WP | **1** | EA | $8,845.10 | $8,845 |
| 1382 | Junc Box, mech controls by others | **13** | EA | $66.55 | $865 |
| 1383 | Install Nema 0 Motor Starter FBO | **11** | EA | $356.95 | $3,926 |
| 1384 | Install Nema 1 Motor Starter FBO | **2** | EA | $471.90 | $944 |
| 1385 | Install <=10HP VFD FBO | **5** | EA | $1,367.30 | $6,837 |
| 1386 | Install 20HP VFD FBO | **2** | EA | $2,081.20 | $4,162 |
| 1387 | Install 25HP VFD FBO | **2** | EA | $2,734.60 | $5,469 |
| 1388 | Install 50HP VFD FBO | **4** | EA | $3,448.50 | $13,794 |
| 1389 | Chiller CP Conn's | **1** | EA | $3,726.80 | $3,727 |
| 1390 | | | | | |
| 1391 | Power Circuitry | | | | |
| 1392 | 3/4" Emt, empty | **520** | LF | $10.61 | $5,518 |
| 1393 | 3/4" Emt, 4#12 | **4,760** | LF | $13.85 | $65,924 |
| 1394 | 3/4" Emt, 4#10 | **2,880** | LF | $14.98 | $43,149 |
| 1395 | 1" Emt, 4#8 | **600** | LF | $21.47 | $12,879 |
| 1396 | 1 1/4" Emt, 4#4 | **200** | LF | $29.05 | $5,810 |
| 1397 | 1 1/4" Emt, 4#2 | **2,790** | LF | $32.34 | $90,238 |
| 1398 | 1 1/2" Emt, 4#1 | **850** | LF | $38.81 | $32,990 |
| 1399 | 2" Emt, 4 1/0 | **930** | LF | $44.39 | $41,287 |
| 1400 | 2" Emt, 4 2/0 | **800** | LF | $48.07 | $38,459 |
| 1401 | 2" Emt, 4 3/0 | **200** | LF | $53.49 | $10,699 |
| 1402 | 2 1/2" Emt, 4 4/0 | **80** | LF | $62.02 | $4,962 |
| 1403 | 2 1/2" Emt, 4 250Mcm | **60** | LF | $66.48 | $3,989 |
| 1404 | 3" Emt, 4 350Mcm | **420** | LF | $81.49 | $34,227 |
| 1405 | 3 1/2" Emt, 4 500 Mcm | **1,820** | LF | $105.02 | $191,129 |
| 1406 | 4#6 MI Cable | **50** | LF | $41.27 | $2,064 |
| 1407 | 4#2 MI Cable | **200** | LF | $83.99 | $16,797 |
| 1408 | | | | | |
| 1409 | Service Grounding | **1** | LS | $5,033.60 | $5,034 |
| 1410 | Lightning Protection System (Preventor) | **1** | LS | $34,485.00 | $34,485 |
| 1411 | | | | | |
| 1412 | Light Fixtures | | | | |
| 1413 | Type G4 | **80** | EA | $886.93 | $70,954 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1414 | Type LK24 | **24** | EA | $474.32 | $11,384 |
| 1415 | Type LP8 | **9** | EA | $1,185.80 | $10,672 |
| 1416 | Type LR2 | **1,173** | EA | $411.40 | $482,572 |
| 1417 | Type LS2 | **1** | EA | $411.40 | $411 |
| 1418 | Type LS4 | **41** | EA | $310.97 | $12,750 |
| 1419 | Type LS4A | **22** | EA | $310.97 | $6,841 |
| 1420 | Type LS8 | **21** | EA | $621.94 | $13,061 |
| 1421 | Type LUL | **61** | EA | $310.97 | $18,969 |
| 1422 | Type PC1 | **24** | EA | $381.15 | $9,148 |
| 1423 | Type PC2 | **29** | EA | $381.15 | $11,053 |
| 1424 | Type PC3 | **186** | EA | $381.15 | $70,894 |
| 1425 | Type RC1 | **88** | EA | $381.15 | $33,541 |
| 1426 | Type RC2 | **56** | EA | $381.15 | $21,344 |
| 1427 | Type RSH | **1** | EA | $393.25 | $393 |
| 1428 | Type SP1 | **83** | EA | $617.10 | $51,219 |
| 1429 | Type Exit | **71** | EA | $332.75 | $23,625 |
| 1430 | Type LC2 | **72** | LF | $114.35 | $8,233 |
| 1431 | Type LC3 | **3,090** | LF | $114.35 | $353,326 |
| 1432 | Type LWS | **624** | LF | $124.03 | $77,392 |
| 1433 | Type LSL | **60** | LF | $130.08 | $7,805 |
| 1434 | Add for additional lighting | **137,385** | SF | $0.35 | $48,085 |
| 1435 | Reduce lighting | **(1)** | LS | $221,000.00 | ($221,000) |
| 1436 | Branch Circuitry | | | | |
| 1437 | 3/4" Emt, 4#12 | **15,624** | LF | $12.65 | $197,635 |
| 1438 | MC Cable | **46,871** | LF | $5.18 | $242,733 |
| 1439 | 3/4" Emt, 4#10 | **880** | LF | $16.66 | $14,662 |
| 1440 | 1" Emt, 4#8 | **60** | LF | $21.47 | $1,288 |
| 1441 | 1" Emt, 4#6 | **160** | LF | $22.87 | $3,659 |
| 1442 | Plenum Cable | **9,930** | LF | $1.59 | $15,740 |
| 1443 | | | | | |
| 1444 | Wiring Devices | | | | |
| 1445 | Switches | **11** | EA | $78.65 | $865 |
| 1446 | Momentary Contact Switches | **9** | EA | $124.03 | $1,116 |
| 1447 | OS, PS Power Pack | **145** | EA | $181.50 | $26,318 |
| 1448 | Local Switch/Dimming Station L | **226** | EA | $151.25 | $34,183 |
| 1449 | Occupancy Sensor | **322** | EA | $202.68 | $65,261 |
| 1450 | Photo Sensor | **114** | EA | $202.68 | $23,105 |
| 1451 | Receptacles | **512** | EA | $78.65 | $40,269 |
| 1452 | Junc Boxes, Misc | **5** | EA | $64.13 | $321 |
| 1453 | Receptacles GFI | **217** | EA | $96.80 | $21,006 |
| 1454 | Receptacles Quad | **317** | EA | $129.47 | $41,042 |
| 1455 | Receptacles GFI Quad | **5** | EA | $159.72 | $799 |
| 1456 | Receptacles GFI WP | **24** | EA | $177.87 | $4,269 |
| 1457 | Receptacles w/ I/O Module | **28** | EA | $96.80 | $2,710 |
| 1458 | Receptacles Quad w/ I/O Modules | **3** | EA | $181.50 | $545 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1459 | Receptacle USB | **13** | EA | $102.85 | $1,337 |
| 1460 | Cord Reel Receptacle | **7** | EA | $580.80 | $4,066 |
| 1461 | Cond Pump Conn | **12** | EA | $133.10 | $1,597 |
| 1462 | Install Leak Det FBO | **12** | EA | $121.00 | $1,452 |
| 1463 | Sol Valve Conn | **2** | EA | $121.00 | $242 |
| 1464 | FS Conn | **7** | EA | $121.00 | $847 |
| 1465 | GSM Conn | **7** | EA | $121.00 | $847 |
| 1466 | Floor Power Outlet | **2** | EA | $399.30 | $799 |
| 1467 | 4-Pole Lighting Contactor | **1** | EA | $635.25 | $635 |
| 1468 | 12-Pole Lighting Contactor | **1** | EA | $1,500.40 | $1,500 |
| 1469 | EPO Pushbutton | **3** | EA | $229.90 | $690 |
| 1470 | Fume Hood Conn | **3** | EA | $157.30 | $472 |
| 1471 | Manual Snap Switch Starter VRF, VAV,misc | **177** | EA | $181.50 | $32,126 |
| 1472 | 20/1 Amp Receptacle L5-20 | **11** | EA | $84.70 | $932 |
| 1473 | 20/1 Amp Eqpt Conn | **12** | EA | $66.55 | $799 |
| 1474 | 30/1 Amp Receptacle L5-30 | **11** | EA | $117.98 | $1,298 |
| 1475 | 30 Amp Receptacle | **3** | EA | $130.08 | $390 |
| 1476 | 30 Amp Stage Receptacle / strip conn | **8** | EA | $798.60 | $6,389 |
| 1477 | 50 Amp Receptacle | **1** | EA | $193.60 | $194 |
| 1478 | 60 Amp Receptacle, weld | **2** | EA | $205.70 | $411 |
| 1479 | | | | | |
| 1480 | Fire Alarm | | | | |
| 1481 | Teflon Cable | **33,345** | LF | $2.34 | $78,113 |
| 1482 | 3" Rigid, Riser Cables | **60** | LF | $114.95 | $6,897 |
| 1483 | Pull Station | **24** | EA | $229.90 | $5,518 |
| 1484 | Audible/Visual | **205** | EA | $347.88 | $71,314 |
| 1485 | Audible/Visual WP | **1** | EA | $405.35 | $405 |
| 1486 | Smoke Detector | **158** | EA | $387.20 | $61,178 |
| 1487 | CO Detector | **5** | EA | $350.90 | $1,755 |
| 1488 | Beam-Type Smoke Detector | **11** | EA | $1,052.70 | $11,580 |
| 1489 | Strobe | **51** | EA | $229.90 | $11,725 |
| 1490 | WP Beacon | **2** | EA | $287.38 | $575 |
| 1491 | Duct Detector | **40** | EA | $889.35 | $35,574 |
| 1492 | Central Equipment, testing, Voice Command | **1** | LS | $66,477.40 | $66,477 |
| 1493 | Radio Box, Antenna, wiring | **1** | EA | $4,549.60 | $4,550 |
| 1494 | Fused Disc | **1** | EA | $738.10 | $738 |
| 1495 | Door Release DH | **6** | EA | $459.80 | $2,759 |
| 1496 | Ansul Conn's | **1** | LS | $895.40 | $895 |
| 1497 | Remote Mic EVAC | **1** | EA | $580.80 | $581 |
| 1498 | Annunciator Panel | **3** | EA | $2,323.20 | $6,970 |
| 1499 | Misc Connections, Relays | **25** | EA | $272.25 | $6,806 |
| 1500 | Knox Box | **1** | EA | $520.30 | $520 |
| 1501 | | | | | |
| 1502 | Communications System | | | | |
| 1503 | MDF Rack, PP's, Terms | **1** | EA | $14,762.00 | $14,762 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1504 | IDF Rack, PP's, Terms | **3** | EA | $7,381.00 | $22,143 |
| 1505 | 4" Floor Sleeves | **16** | EA | $229.90 | $3,678 |
| 1506 | 4" Wall Sleeves | **16** | EA | $229.90 | $3,678 |
| 1507 | Main Ground Bar | **1** | EA | $1,476.20 | $1,476 |
| 1508 | Tel Ground Bar | **3** | EA | $738.10 | $2,214 |
| 1509 | #3/0G Wire | **600** | LF | $9.19 | $5,511 |
| 1510 | Cable Tray 24" Alum | **1,570** | LF | $41.62 | $65,350 |
| 1511 | 12 Strand Multi-Mode Fiber | **600** | LF | $6.18 | $3,710 |
| 1512 | 6 Strand Multi-Mode Fiber | **600** | LF | $4.30 | $2,577 |
| 1513 | Cu Distr Cable | **600** | LF | $10.29 | $6,171 |
| 1514 | 1" EMT CDT | **172** | LF | $14.40 | $2,477 |
| 1515 | 2" EMT CDT | **1,040** | LF | $22.90 | $23,819 |
| 1516 | 4" EMT Cdt | **200** | LF | $34.64 | $6,928 |
| 1517 | Cat 6 Cable | **103,500** | LF | $1.59 | $164,058 |
| 1518 | WAP Outlet AN 2c | **14** | EA | $89.54 | $1,254 |
| 1519 | Tel Outlet | **60** | EA | $72.60 | $4,356 |
| 1520 | Data Outlet | **2** | EA | $72.60 | $145 |
| 1521 | Data Duplex Outlet 2c | **78** | EA | $89.54 | $6,984 |
| 1522 | Tel/Data Outlet 3c | **76** | EA | $111.93 | $8,506 |
| 1523 | Floor Tel/Data Outlet 3c | **6** | EA | $399.30 | $2,396 |
| 1524 | Tel/Data Outlet T 2c | **47** | EA | $89.54 | $4,208 |
| 1525 | TVE 2c | **50** | EA | $169.40 | $8,470 |
| 1526 | TVC 2c | **2** | EA | $169.40 | $339 |
| 1527 | | | | | |
| 1528 | Clock/ Public Address System: | | | | |
| 1529 | 2 1/2" Emt, Riser Cables | **50** | LF | $66.74 | $3,337 |
| 1530 | 3/4" EMT Cdt | **2,730** | LF | $11.93 | $32,571 |
| 1531 | 1" EMT Cdt | **2,530** | LF | $14.40 | $36,429 |
| 1532 | Comm Cable | **14,100** | LF | $1.59 | $22,350 |
| 1533 | Main Sound Rack | **1** | LS | $48,884.00 | $48,884 |
| 1534 | Local Sound System Rack | **2** | EA | $7,792.40 | $15,585 |
| 1535 | Outlet S Speaker | **232** | EA | $254.10 | $58,951 |
| 1536 | Outlet S Speaker WP | **19** | EA | $344.85 | $6,552 |
| 1537 | Volume Control | **26** | EA | $181.50 | $4,719 |
| 1538 | Master Clock GPS | **1** | EA | $5,493.40 | $5,493 |
| 1539 | Clock Antenna | **1** | EA | $1,863.40 | $1,863 |
| 1540 | Wireless Clock Transceiver | **1** | EA | $2,855.60 | $2,856 |
| 1541 | Wireless Clock Repeater | **4** | EA | $1,427.80 | $5,711 |
| 1542 | Clock, wireless | **73** | EA | $254.10 | $18,549 |
| 1543 | | | | | |
| 1544 | A/V System: | | | | |
| 1545 | 1" EMT Cdt | **1,600** | LF | $14.40 | $23,038 |
| 1546 | BP Button Panel | **41** | EA | $99.83 | $4,093 |
| 1547 | R1 Receptacle Panel | **41** | EA | $99.83 | $4,093 |
| 1548 | V1 Video Projector | **41** | EA | $99.83 | $4,093 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1549 | S1 Speaker | **82** | EA | $99.83 | $8,186 |
| 1550 | AV Eqpt, Inst, LV Wiring - Proj/Assist List | **41** | RM | | |
| 1551 | J1 | **2** | EA | $99.83 | $200 |
| 1552 | Data Outlet P Projector | **1** | EA | $99.83 | $100 |
| 1553 | Screen | **1** | EA | $99.83 | $100 |
| 1554 | R2 Receptacle Panel | **4** | EA | $169.40 | $678 |
| 1555 | R3 Receptacle Panel | **4** | EA | $169.40 | $678 |
| 1556 | Speaker S1 Backbox | **4** | EA | $99.83 | $399 |
| 1557 | Speaker S2 Backbox | **4** | EA | $99.83 | $399 |
| 1558 | Speaker S3 Backbox | **14** | EA | $99.83 | $1,398 |
| 1559 | AV Rack Enclosure | **1** | EA | $459.80 | $460 |
| 1560 | AV Eqpt, Installation, LV Wiring - ALLOW | **1** | LS | | |
| 1561 | Gym Sound System Mat'l Package | **1** | LS | $45,000.00 | $45,000 |
| 1562 | Auditorium AV Roughin | **1** | LS | $45,000.00 | $45,000 |
| 1563 | ) | | | | |
| 1564 | Theater Lighting & Control System:ALLOW (Eqpt in "Equipment S | | | | |
| 1565 | Lighting and Controls included in "Equipment Section" | | | | |
| 1566 | Theat Lighting & Power Roughin | **1** | LS | $30,000.74 | $30,001 |
| 1567 | Theat Lighting Controls Roughin | **1** | LS | $10,000.25 | $10,000 |
| 1568 | | | | | |
| 1569 | Security Intrusion Alarm System: | | | | |
| 1570 | Power Supply Junc Box, 120v | **1** | EA | $459.80 | $460 |
| 1571 | Central Eqpt | **1** | EA | $14,713.60 | $14,714 |
| 1572 | 3/4" Emt, 4#12 | **40** | LF | $13.85 | $554 |
| 1573 | Plenum Cables | **4,800** | LF | $1.59 | $7,608 |
| 1574 | 3/4" Emt | **720** | LF | $11.93 | $8,590 |
| 1575 | CR Card Reader | **9** | EA | $810.70 | $7,296 |
| 1576 | K Keypad | **2** | EA | $810.70 | $1,621 |
| 1577 | EL Electric Lock | **5** | EA | $490.05 | $2,450 |
| 1578 | EH Electric Hinge | **30** | EA | $490.05 | $14,702 |
| 1579 | Intercom | **2** | EA | $520.30 | $1,041 |
| 1580 | PT Install Power Transfer Hinge FBO | **16** | EA | $411.40 | $6,582 |
| 1581 | REX Req to Exit | **21** | EA | $290.40 | $6,098 |
| 1582 | DC Door Position Sw | **54** | EA | $199.65 | $10,781 |
| 1583 | M Motion Sensor | **71** | EA | $411.40 | $29,209 |
| 1584 | TS Door Switch | **16** | EA | $181.50 | $2,904 |
| 1585 | DJ Door Junc Box | **16** | EA | $139.15 | $2,226 |
| 1586 | | | | | |
| 1587 | CCTV System: | | | | |
| 1588 | 3/4" EMT Cdt | **870** | LF | $11.41 | $9,927 |
| 1589 | Signal Cables | **11,400** | LF | $1.59 | $18,070 |
| 1590 | Monitoring/Recording Eqpt | **1** | LS | $33,577.50 | $33,578 |
| 1591 | Viewing Console | **2** | EA | $1,161.60 | $2,323 |
| 1592 | Data Outlet CAM, Camera | **55** | EA | $1,294.70 | $71,209 |
| 1593 | Data Outlet CAM, Camera WP | **15** | EA | $1,996.50 | $29,948 |

# *Fuller Middle School*

Framingham, MA

137,385 GSF

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | | Total |
|---|---|---|---|---|---|---|
| 1594 | | | | | | |
| 1595 | BDA System | **1** | LS | $136,000.00 | | $136,000 |
| 1596 | Area of Rescue Assistance | **1** | LS | $20,000.00 | | $20,000 |
| 1597 | | | | | | |
| 1598 | Temp Power and Lighting | **1** | LS | $89,540.00 | | $89,540 |
| 1599 | | | | | | |
| 1600 | Site Lighting, Site Eqpt | | | | | |
| 1601 | Type SL1, 1-Fixt, 30' pole | **35** | EA | $4,767.40 | | $166,859 |
| 1602 | Type SL1A, 1-Fixt, 30' pole | | EA | $4,767.40 | | |
| 1603 | Type SL3, Wallpack | **9** | EA | $701.80 | | $6,316 |
| 1604 | Type SL5 Pedestrian Light Pole | **8** | EA | $3,242.80 | | $25,942 |
| 1605 | Type SL4 Exterior Wallpack | **17** | EA | $701.80 | | $11,931 |
| 1606 | WP Signage w/ Lights, FBO | **1** | EA | $1,113.20 | | $1,113 |
| 1607 | Type SL10 Plant uplight | **12** | EA | $520.30 | | $6,244 |
| 1608 | Type SL11 | **13** | EA | $1,113.20 | | $14,472 |
| 1609 | Type SLS | **7** | EA | $733.00 | | $5,131 |
| 1610 | Receptacle WP GFI | **5** | EA | $284.35 | | $1,422 |
| 1611 | CCTV Camera, Pole Mtd | **3** | EA | $1,863.40 | | $5,590 |
| 1612 | Elect Vehicle Charging Station | **3** | EA | $1,645.60 | | $4,937 |
| 1613 | Relocate Exist EM Call Box | **2** | EA | $1,113.20 | | $2,226 |
| 1614 | Time Clock | **1** | EA | $1,004.30 | | $1,004 |
| 1615 | | | | | | |
| 1616 | Branch Circuitry: | | | | | |
| 1617 | 3/4" Emt, 4#10 | **280** | LF | $14.98 | BP#1 | |
| 1618 | 1" PVC CDT UG | **7,110** | LF | $5.41 | BP#1 | |
| 1619 | 2" PVC CDT UG | **900** | LF | $7.70 | BP#1 | |
| 1620 | 2 1/2" PVC CDT UG | **3,600** | LF | $10.31 | BP#1 | |
| 1621 | 17x30x12" Site Pullbox | **16** | EA | $2,323.20 | | $37,171 |
| 1622 | Handhole | **6** | EA | $2,323.20 | | $13,939 |
| 1623 | #10 Wire | **12,400** | LF | $1.25 | | $15,535 |
| 1624 | #8 Wire | **16,050** | LF | $1.76 | | $28,261 |
| 1625 | #6 Wire | **2,700** | LF | $2.11 | | $5,707 |
| 1626 | Signal Cable | **1,250** | LF | $1.82 | | $2,269 |
| 1627 | | | | | | |
| 1628 | Site Power, EG Feeders, Utilities: | | | | | |
| 1629 | 4" PVC (Primary, empty) UG | **460** | LF | $16.95 | | $7,797 |
| 1630 | 4" PVC CDT, 4 600 Mcm, UG (service) | **600** | LF | $104.70 | | $62,819 |
| 1631 | 4" PVC CDT UG (spare) | **100** | LF | $16.95 | | $1,695 |
| 1632 | 4" PVC CDT, 4 500 Mcm, UG (EG) | **100** | LF | $87.18 | | $8,718 |
| 1633 | 2" PVC, 4#1/0 UG (EG) | **100** | LF | $29.19 | | $2,919 |
| 1634 | 2 1/2" PVC, 4#4/0 UG (EG) | **100** | LF | $38.87 | | $3,887 |
| 1635 | 1" PVC, EG Controls, Misc UG | **200** | LF | $10.44 | | $2,088 |
| 1636 | Utility Pole Riser | **1** | LF | $4,767.40 | | $4,767 |
| 1637 | Utility Transformer Pad | **1** | LS | $4,162.40 | | $4,162 |
| 1638 | Manhole | **2** | EA | $11,616.00 | | $23,232 |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1639 | Trenching, Concrete, Backfill | **1** | LS | $100,000.00 | BP#1 |
| 1640 | | | | | |
| 1641 | Miscellaneous: | | | | |
| 1642 | 4" PVC CDT UG (Comm) | **800** | LF | $16.95 | $13,560 |
| 1643 | Innerduct | **600** | LF | $3.99 | $2,396 |
| 1644 | Tel Utility Pole Riser | **1** | LS | $3,121.80 | $3,122 |
| 1645 | 3'x3' Comm Handhole | **1** | EA | $6,243.60 | $6,244 |
| 1646 | | | | | |
| 1647 | Misc Site Demo | **1** | LS | $10,890.00 | BP#1 |
| 1648 | Site Security Lighting | **1** | LS | $12,584.00 | $12,584 |
| 1649 | Temp Power and Lighting | **1** | LS | $31,460.00 | $31,460 |
| 1650 | Eqpt Rentals | **1** | LS | $7,260.00 | $7,260 |
| 1651 | **26,27,28-ELECTRICAL, COMMUNICATION, SECURITY TOTAL** | | | | $5,893,015 |
| 1652 | | | | | |
| 1653 | | | | | |
| 1654 | **31-EARTHWORK** | | | | |
| 1655 | | | | | |
| 1656 | ***31 00 00 Earthwork*** | | | | |
| 1657 | See Sitework | | | | |
| 1658 | **31 00 00 Earthwork Total** | | | | |
| 1659 | | | | | |
| 1660 | | | | | |
| 1661 | | | | | |

# *Fuller Middle School*

Framingham, MA

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | *Quantity* | *Unit* | *Unit Rate* | *Total* |
|---|---|---|---|---|---|
| 1662 | **02-EXISTING CONDITIONS** | | | | |
| 1663 | | | | | |
| 1664 | **02 41 00 Demolition** | | | | |
| 1665 | | | | | BP#1 |
| 1666 | G1020.01 Building Demolition | | | | $0 |
| 1667 | 02 30 00 Building Demolition | | | | $0 |
| 1668 | Building demoltion | | | | See Main Summa |
| 1669 | **02 41 00 Demolition Total** | | | | **$0** |
| 1670 | | | | | |
| 1671 | | | | | |
| 1672 | **31-EARTHWORK** | | | | |
| 1673 | | | | | |
| 1674 | **31 00 00 Earthwork** | | | | |
| 1675 | Site prep | **258,370** | SF | $1.00 | BP#1 |
| 1676 | Trench and backfill only | **313** | LF | $45.00 | BP#1 |
| 1677 | Baseball field | **0** | 0 | $0.00 | Existing to Rema |
| 1678 | **31 00 00 Earthwork Total** | | | | **$0** |
| 1679 | | | | | |
| 1680 | **31 10 00 Site Clearing** | | | | |
| 1681 | Site clearing | **7** | ACRE | $5,000.00 | BP#1 |
| 1682 | Safety barricade | **1** | AL | $60,000.00 | BP#1 |
| 1683 | Construction fence, install, maintain, remove & reinstall; f | **11,344** | LF | $12.00 | BP#1 |
| 1684 | Double construction gate | **2** | PR | $2,500.00 | BP#1 |
| 1685 | Temporary construction entrance | **2** | LOC | $7,000.00 | BP#1 |
| 1686 | Add premium for moving and reinstalling for 3 phases | **1** | LS | $37,385.00 | BP#1 |
| 1687 | Temporary Jersey Barriers;  purchase and install | **3,145** | LF | $65.00 | BP#1 |
| 1688 | Temp signs | **1** | LS | $3,000.00 | BP#1 |
| 1689 | Wash down/re-fueling/parking allowance | **3,000** | SF | $2.00 | BP#1 |
| 1690 | Temporary pavement | **47,106** | SF | $3.00 | BP#1 |
| 1691 | Temporary sedimentation and runoff basin | **7,348** | SF | $2.00 | BP#1 |
| 1692 | **31 10 00 Site Clearing Total** | | | | **$0** |
| 1693 | | | | | |
| 1694 | **31 23 19 Dewatering and Drainage** | | | | |
| 1695 | Dewatering for sitework excavation; allow | **1** | LS | $100,000.00 | BP#1 |
| 1696 | **31 23 19 Dewatering and Drainage Total** | | | | **$0** |
| 1697 | | | | | |
| 1698 | **31 25 00 Erosion and Sedimentation Controls** | | | | |
| 1699 | Erosion control barrier | **1,206** | LF | $14.00 | BP#1 |
| 1700 | Stockpile area (all phases), qty provided | **35,000** | CY | $2.50 | BP#1 |
| 1701 | FM; discharge temp basin to existing DMH | **271** | LF | $75.00 | BP#1 |
| 1702 | Stormwater basin | **3,547** | SF | $2.50 | BP#1 |
| 1703 | **31 25 00 Erosion and Sedimentation Controls Total** | | | | **$0** |
| 1704 | | | | | |

# *Fuller Middle School*

Framingham, MA

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | *Quantity* | *Unit* | *Unit Rate* | *Total* |
|---|---|---|---|---|---|
| 1705 | **32-EXTERIOR IMPROVEMENTS** | | | | |
| 1706 | | | | | |
| 1707 | **32 12 00 Flexible Paving** | | | | |
| 1708 | Existing public roadway 'Flagg Drive' to remain | **0** | SF | $0.00 ETR | |
| 1709 | Vehicular asphalt pavement, incl's temporary pavement | **202,060** | SF | $3.00 BP#1 | |
| 1710 | Raised bituminous pavement (stamped) | **11,716** | SF | $15.00 BP#1 | |
| 1711 | Gravel base to roadway & parking lot | **9,445** | CY | $35.00 BP#1 | |
| 1712 | 32 17 00 Paving Specialties | **0** | 0 | $0.00 BP#1 | |
| 1713 | Crosswalk | **2,350** | SF | $2.50 BP#1 | |
| 1714 | Parking stall painting | **302** | EA | $15.00 BP#1 | |
| 1715 | Parking stall painting; HC | **12** | EA | $75.00 BP#1 | |
| 1716 | Crosswalk striping, temporary | **2,440** | SF | $2.50 BP#1 | |
| 1717 | Temporary parking spaces, incl's HC bus | **162** | EA | $75.00 BP#1 | |
| 1718 | Jersey barrier between vehicle parking, temporary | **745** | LF | $10.00 BP#1 | |
| 1719 | Misc. marking other than above | **1** | LS | $50,000.00 BP#1 | |
| 1720 | **32 12 00 Flexible Paving Total** | | | | **$0** |
| 1721 | | | | | |
| 1722 | **32 14 00 Unit Paving** | | | | |
| 1723 | Concrete paving/Conc sidewalk | **17,115** | SF | $10.00 BP#2 | |
| 1724 | **32 14 00 Unit Paving Total** | | | | **$0** |
| 1725 | | | | | |
| 1726 | **32 16 00 Curbs and Gutters** | | | | |
| 1727 | VGC; vertical granite curb | **3,965** | LF | $42.00 BP#1 | |
| 1728 | SGC; sloped granite curb | **191** | LF | $43.50 BP#1 | |
| 1729 | PCC; precast concrete curb | **8,105** | LF | $25.00 BP#1 | |
| 1730 | Bit. berm curb | **1,336** | LF | $5.00 BP#1 | |
| 1731 | **32 16 00 Curbs and Gutters Total** | | | | **$0** |
| 1732 | | | | | |
| 1733 | **32 17 00 Paving Specialties** | | | | |
| 1734 | Bituminous conc sidewalk | **26,443** | SF | $2.25 BP#1 | |
| 1735 | Gravel base to concrete pavement | **807** | CY | $35.00 BP#1 | |
| 1736 | Curb cut | **15** | EA | $450.00 BP#1 | |
| 1737 | Concrete pad | **1** | AL | $24,000.00 BP#1 | |
| 1738 | Handicap ramp | **402** | SF | $20.00 BP#1 | |
| 1739 | Temporary modular handicap ramp | **138** | SF | $20.00 BP#1 | |
| 1740 | **32 17 00 Paving Specialties Total** | | | | **$0** |
| 1741 | | | | | |
| 1742 | **32 30 00 Site Improvements** | | | | |
| 1743 | Unit block retaining wall | **0** | 0 | $0.00 | $0 |
| 1744 | Footing | **361** | lf | $0.00 | $0 |
| 1745 | Concrete | **28** | CY | $135.00 BP#2 | |
| 1746 | Concrete; place | **28** | CY | $85.00 BP#2 | |
| 1747 | Reinforing | **1,820** | LBS | $1.10 BP#2 | |

# *Fuller Middle School*

Framingham, MA

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | *Quantity* | *Unit* | *Unit Rate* | *Total* |
|---|---|---|---|---|---|
| 1748 | Formwork | **2,166** | SF | $12.00 BP#2 | |
| 1749 | *Wall* | **1,264** | sf | $0.00 | $0 |
| 1750 | Concrete material | **42** | CY | $135.00 BP#2 | |
| 1751 | Concrete; place | **42** | CY | $85.00 BP#2 | |
| 1752 | Reinforing | **6,300** | LBS | $1.10 BP#2 | |
| 1753 | Formwork | **2,166** | SF | $12.00 BP#2 | |
| 1754 | Wall | **1,264** | SF | $28.00 BP#2 | |
| 1755 | Concrete bench w/wooden top | **20** | LF | $275.00 | $5,500 |
| 1756 | Segmented retaining wall | **3,000** | LF | $50.00 | $150,000 |
| 1757 | Flagpole | **2** | EA | $7,500.00 | $15,000 |
| 1758 | Traffic signs | **1** | AL | $10,000.00 BP#1 | |
| 1759 | Peastone drip edge around building; 1'-6" wide | **50** | CY | $75.00 | $3,750 |
| 1760 | Stonedust paving | **1** | LS | $1,750.00 | $1,750 |
| 1761 | Pavers at entry | **745** | SF | $15.00 | $11,175 |
| 1762 | Bicycle racks | **20** | EA | $950.00 | $19,000 |
| 1763 | Basketball pavement | **0** | 0 | $0.00 BP#1 | |
| 1764 | Basketball court; fence, gate, court marking | **1,750** | SF | $35.00 | $61,250 |
| 1765 | **32 30 00 Site Improvements Total** | | | | **$267,425** |
| 1766 | | | | | |
| 1767 | **32 31 00 Fences and Gates** | | | | |
| 1768 | Guardrail | **1** | LS | $35,000.00 | $35,000 |
| 1769 | Galvanized handrails @ ramps and steps | **219** | LF | $250.00 | $54,750 |
| 1770 | **32 31 00 Fences and Gates Total** | | | | **$89,750** |
| 1771 | | | | | |
| 1772 | **32 80 00 Irrigation** | | | | |
| 1773 | See the field | | | | $0 |
| 1774 | **32 80 00 Irrigation Total** | | | | **$0** |
| 1775 | | | | | |
| 1776 | **32 92 00 Turfs and Grasses** | | | | |
| 1777 | Topsoil for planting beds, shrubs and perennials | **276** | CY | $25.00 | $6,900 |
| 1778 | Sports field mix (seed) | **258,370** | SF | $0.35 | $90,430 |
| 1779 | Native wildflower meadow | **104,342** | SF | $0.50 | $52,171 |
| 1780 | Lawn (seed) | **121,052** | SF | $0.35 | $42,368 |
| 1781 | Sod at ampitheater | **25,902** | SF | $1.50 | $38,853 |
| 1782 | Sod at play areas | **24,038** | SF | $1.50 | $36,057 |
| 1783 | Plant bed | **7,900** | SF | $10.00 | $79,000 |
| 1784 | Temporary at playing field sod | **5,000** | SF | $1.50 | $7,500 |
| 1785 | Mulch | **1** | LS | $30,000.00 | $30,000 |
| 1786 | Remove and install new irrigation System | **82,000** | SF | $3.00 | $246,000 |
| 1787 | South Sports Field | **0** | 0 | $0.00 | By Others |
| 1788 | Irrigation in front of Ampitheater | **25,902** | SF | $2.00 | $51,804 |
| 1789 | Irrigation at play areas | **24,038** | SF | $2.00 | $48,076 |
| 1790 | Fine grading | **121,052** | SF | $0.75 | $90,789 |

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | *Quantity* | *Unit* | *Unit Rate* | *Total* |
|---|---|---|---|---|---|
| 1791 | **32 92 00 Turfs and Grasses Total** | | | | **$819,947** |
| 1792 | | | | | |
| 1793 | **32 93 00 Plants** | | | | |
| 1794 | Trees | | | | |
| 1795 | AL; Allegheny Serviceberry 2½ - 3" Cal | **12** | EA | $900.00 | $10,800 |
| 1796 | AC; Shadblow Serviceberry 2½ - 3" Cal | **1** | EA | $900.00 | $900 |
| 1797 | AR; Red Maple 3 - 3½" Cal | **6** | EA | $850.00 | $5,100 |
| 1798 | CK; American Yellowwood 3 - 3½" Cal | **24** | EA | $800.00 | $19,200 |
| 1799 | FG; American Beech 3 - 3½" Cal | **11** | EA | $850.00 | $9,350 |
| 1800 | LT; Tulip Tree 3 - 3½" Cal | **8** | EA | $900.00 | $7,200 |
| 1801 | NS; Black Tupelo 3 - 3½" Cal | **15** | EA | $850.00 | $12,750 |
| 1802 | OA; Sourwood 2½-3" Cal | **3** | EA | $750.00 | $2,250 |
| 1803 | PA; London Plain Tree 3 - 3½" Cal | **24** | EA | $850.00 | $20,400 |
| 1804 | QP; Pin Oak 3 - 3½" Cal | **7** | EA | $900.00 | $6,300 |
| 1805 | QR; Red Oak 3 - 3½" Cal | **7** | EA | $950.00 | $6,650 |
| 1806 | Shrubs | | | | |
| 1807 | CA; Sweet Pepperbush 3½ - 4' HT | **28** | EA | $95.00 | $2,660 |
| 1808 | HQ; Oak-leaf Hydrangea 3 - 3½' HT | **49** | EA | $95.00 | $4,655 |
| 1809 | HV; Witch Hazel 7- 8' B+B | **3** | EA | $350.00 | $1,050 |
| 1810 | IG; Compact Incberry 2½ - 3' HT | **33** | EA | $125.00 | $4,125 |
| 1811 | IV; Winterberry 2 - 2½ HT | **61** | EA | $95.00 | $5,795 |
| 1812 | JC; Common Juniper 24" SPD | **0** | EA | $75.00 | $0 |
| 1813 | JH; Creeping Juniper 15-24" SPD | **68** | EA | $75.00 | $5,100 |
| 1814 | JV; Eastern Red Cedar 7- 8' HT | **26** | EA | $250.00 | $6,500 |
| 1815 | MG; Sweetgale 3½ - 4' HT | **38** | EA | $95.00 | $3,610 |
| 1816 | PF; Pink Beauty Potentilla 24" SPD | **22** | EA | $75.00 | $1,650 |
| 1817 | RA; Grow Low Sumac 2 - 2½' SPD | **47** | EA | $115.00 | $5,405 |
| 1818 | RT; Staghorn Sumac 3 Gal | **13** | EA | $115.00 | $1,495 |
| 1819 | RV; Virginia Rose 2½ - 3' SPD | **0** | EA | $75.00 | $0 |
| 1820 | VA; Lowbush Blueberry 15-24" SPD | **53** | EA | $75.00 | $3,975 |
| 1821 | VD; Arrowwood 4 - 4½' HT | **31** | EA | $150.00 | $4,650 |
| 1822 | VT; Dwarf Cranberry Bush 3 - 3½' HT | **12** | EA | $115.00 | $1,380 |
| 1823 | *Groundcover* | | | | |
| 1824 | CP; Sweet Fern 1 Gal | **1,966** | EA | $20.00 | $39,320 |
| 1825 | Planting beds allowance | **1** | LS | $20,000.00 | $20,000 |
| 1826 | Grass at temporary parking area | **6,650** | SF | $0.35 | $2,328 |
| 1827 | Maintenance of landscaping | **1** | LS | $10,000.00 | $10,000 |
| 1828 | **32 93 00 Plants Total** | | | | **$224,598** |
| 1829 | | | | | |
| 1830 | | | | | |
| 1831 | **33-UTILITIES** | | | | |
| 1832 | | | | | |
| 1833 | **33 10 00 Water Distribution** | | | | |

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | *Quantity* | *Unit* | *Unit Rate* | *Total* | |
|---|---|---|---|---|---|---|
| 1834 | 2" Domestic water service | **120** | LF | $60.00 | BP#1 | |
| 1835 | 6" Fire water service | **170** | LF | $70.00 | BP#1 | |
| 1836 | Water service; not sized | **680** | LF | $95.00 | BP#1 | |
| 1837 | Hydrant | **5** | EA | $4,500.00 | BP#1 | |
| 1838 | Miscellaneous gates, valves, etc. (gate valve 8x8x6) | **1** | LS | $10,000.00 | BP#1 | |
| 1839 | **33 10 00 Water Distribution Total** | | | | | **$0** |
| 1840 | | | | | | |
| 1841 | **33 31 00 Sanitary Sewerage** | | | | | |
| 1842 | 6" DI | **78** | LF | $70.00 | BP#1 | |
| 1843 | 6" PVC | **42** | LF | $70.00 | BP#1 | |
| 1844 | 8" PVC | **472** | LF | $75.00 | BP#1 | |
| 1845 | SMH; Sewer manhole | **4** | EA | $4,500.00 | BP#1 | |
| 1846 | CO; Cleanout | **1** | EA | $600.00 | BP#1 | |
| 1847 | Connect to existing | **1** | EA | $3,500.00 | BP#1 | |
| 1848 | Acid neutralization tank | **2** | EA | $7,500.00 | BP#1 | |
| 1849 | Grease trap | **1** | EA | $15,000.00 | BP#1 | |
| 1850 | **33 31 00 Sanitary Sewerage Total** | | | | | **$0** |
| 1851 | | | | | | |
| 1852 | **33 41 00 Storm Utility Drainage** | | | | | |
| 1853 | All incl. trench and backfill | **0** | 0 | $0.00 | | $0 |
| 1854 | 6" PVC | **47** | LF | $35.00 | BP#1 | |
| 1855 | 12" HDPE | **2,435** | LF | $42.00 | BP#1 | |
| 1856 | 15" HDPE | **635** | LF | $45.00 | BP#1 | |
| 1857 | 18" HDPE | **548** | LF | $48.00 | BP#1 | |
| 1858 | 24" HDPE | **371** | LF | $50.00 | BP#1 | |
| 1859 | 30" HDPE | **547** | LF | $60.00 | BP#1 | |
| 1860 | DMH; Manhole | **9** | EA | $3,500.00 | BP#1 | |
| 1861 | CB; catch basin | **19** | EA | $4,500.00 | BP#1 | |
| 1862 | Temporary CB, convert to DMH | **3** | EA | $4,500.00 | BP#1 | |
| 1863 | Headwall @ 24" HDPE end | **2** | EA | $1,500.00 | BP#1 | |
| 1864 | Allowances for: | **0** | 0 | $0.00 | BP#1 | |
| 1865 | Water quality structures | **4** | EA | $15,000.00 | BP#1 | |
| 1866 | Gravel and sod buffer for pretreatment | **1** | LS | $10,000.00 | BP#1 | |
| 1867 | Stormceptors: | **0** | 0 | $0.00 | BP#1 | |
| 1868 | 450i | **2** | EA | $10,000.00 | BP#1 | |
| 1869 | 3600 | **1** | EA | $35,000.00 | BP#1 | |
| 1870 | 6000 | **1** | EA | $60,000.00 | BP#1 | |
| 1871 | Outlet structure | **1** | EA | $5,000.00 | BP#1 | |
| 1872 | Perimeter drainage | **0** | 0 | $0.00 | Bldg Tab | |
| 1873 | **33 41 00 Storm Utility Drainage Total** | | | | | **$0** |
| 1874 | | | | | | |
| 1875 | **33 50 00 Gas Service** | | | | | |
| 1876 | 33 50 00 Gas Service | **0** | 0 | $0.00 | | $0 |

# *Fuller Middle School*

Framingham, MA

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | *Quantity* | *Unit* | *Unit Rate* | *Total* |
|---|---|---|---|---|---|
| 1877 | Connection to existing gas main | **0** | 0 | $0.00 | By Other |
| 1878 | Gas line piping, incl's valves (2) | **0** | 0 | $0.00 | By Other |
| 1879 | **33 50 00 Gas Service Total** | | | | **$0** |
| 1880 | | | | | |
| 1881 | | | | | |
| 1882 | **33 70 00 Electrical Utilities** | | | | |
| 1883 | See building estimate (Section 26) | | | | |
| 1884 | **33 70 00 Electrical Utilities Total** | | | | **$0** |
| 1885 | | | | | |
| 1886 | | | | **SITEWORK SUBTOTAL** | **$1,401,720** |
| 1887 | | | | | |
| 1888 | | | | | |
| 1889 | | | | | |
| 1890 | | | | | |
| 1891 | | | | | |
| 1892 | | | | | |
| 1893 | | | | | |
| 1894 | | | | | |

# Fuller Middle School

Fuller Middle School

## DIRECT COST SUMMARY - NEW CONSTRUCTION

| | DIV. | ELEMENTS | 90%CD TOTAL | 60%CD TOTAL | DIFFERENCE | % DIFF |
|---|---|---|---|---|---|---|
| | | | 137,385 GSF | 136,600 GSF | 785 GSF | 0.57% |
| 1895 | A-G | BUILDING | | | | |
| 1896 | | | | | | |
| 1897 | A | SUBSTRUCTURES | | | | |
| 1898 | | | | | | |
| 1899 | A10 | FOUNDATIONS | | | | |
| 1900 | | Foundations | $75,417 | $1,119,012 | ($1,043,595) | -93.26% |
| 1901 | | Slab on Grade | $0 | $594,006 | ($594,006) | -100.00% |
| 1902 | | FOUNDATIONS TOTAL | **$75,417** | **$1,713,019** | **($1,637,602)** | **-95.60%** |
| 1903 | | | | | | |
| 1904 | A20 | BASEMENT CONSTRUCTION | | | | |
| 1905 | | | | | | |
| 1906 | A | **SUBSTRUCTURES TOTAL** | **$75,417** | **$1,713,019** | **($1,637,602)** | **-95.60%** |
| 1907 | | | | | | |
| 1908 | | | | | | |
| 1909 | B | SHELL | | | | |
| 1910 | | | | | | |
| 1911 | B10 | STRUCTURE | | | | |
| 1912 | | Upper Floor Construction | $41,216 | $2,721,067 | ($2,679,851) | -98.49% |
| 1913 | | Roof Construction | $478,000 | $2,333,165 | ($1,855,165) | -79.51% |
| 1914 | | STRUCTURE TOTAL | **$519,216** | **$5,054,232** | **($4,535,016)** | **-89.73%** |
| 1915 | | | | | | |
| 1916 | B20 | EXTERIOR CLOSURE | | | | |
| 1917 | | Exterior walls | $4,900,274 | $4,646,002 | $254,272 | 5.47% |
| 1918 | | Exterior windows | $1,614,066 | $1,942,628 | ($328,562) | -16.91% |
| 1919 | | Exterior Doors | $187,200 | $213,200 | ($26,000) | -12.20% |
| 1920 | | EXTERIOR CLOSURE TOTAL | **$6,701,540** | **$6,801,830** | **($100,290)** | **-1.47%** |
| 1921 | | | | | | |
| 1922 | B30 | ROOFING | | | | |
| 1923 | | Roof Coverngs | $2,231,175 | $2,265,314 | ($34,139) | -1.51% |
| 1924 | | ROOFING TOTAL | **$2,231,175** | **$2,265,314** | **($34,139)** | **-1.51%** |
| 1925 | | | | | | |
| 1926 | B | **SHELL TOTAL** | **$9,451,930** | **$14,121,376** | **($4,669,445)** | **-33.07%** |
| 1927 | | | | | | |
| 1928 | | | | | | |
| 1929 | C | INTERIORS | | | | |
| 1930 | | | | | | |
| 1931 | C10 | INTERIOR CONSTRUCTION | | | | |
| 1932 | | Partitions | $4,676,743 | $4,412,924 | $263,820 | 5.98% |
| 1933 | | Interior Doors, frames & Hardware | $979,423 | $895,898 | $83,525 | 9.32% |
| 1934 | | Fittings | $1,062,573 | $915,361 | $147,212 | 16.08% |
| 1935 | | INTERIOR CONSTRUCTION TOTAL | **$6,718,739** | **$6,224,182** | **$494,556** | **7.95%** |
| 1936 | | | | | | |
| 1937 | C20 | STAIRCASES | | | | |

# Fuller Middle School

Fuller Middle School

## DIRECT COST SUMMARY - NEW CONSTRUCTION

| | DIV. | ELEMENTS | 90%CD TOTAL | 60%CD TOTAL | DIFFERENCE | % DIFF |
|---|---|---|---|---|---|---|
| | | | 137,385 GSF | 136,600 GSF | 785 GSF | 0.57% |
| 1938 | | Staircases | $371,420 | $590,570 | ($219,150) | -37.11% |
| 1939 | | STAIRCASES TOTAL | **$371,420** | **$590,570** | **($219,150)** | **-37.11%** |
| 1940 | | | | | | |
| 1941 | C30 | INTERIOR FINISHES | | | | |
| 1942 | | Wall finishes | $2,046,567 | $1,767,241 | $279,327 | 15.81% |
| 1943 | | Floor finishes | $1,436,679 | $1,288,200 | $148,480 | 11.53% |
| 1944 | | Ceiling finishes | $2,014,543 | $1,858,543 | $156,000 | 8.39% |
| 1945 | | INTERIOR FINISHES TOTAL | **$5,497,790** | **$4,913,983** | **$583,807** | **11.88%** |
| 1946 | | | | | | |
| 1947 | **C** | **INTERIORS TOTAL** | **$12,587,948** | **$11,728,735** | **$859,213** | **7.33%** |
| 1948 | | | | | | |
| 1949 | | | | | | |
| 1950 | ***D*** | ***SERVICES*** | | | | |
| 1951 | | | | | | |
| 1952 | D10 | VERTICAL MOVEMENT | | | | |
| 1953 | | Conveying System | $223,400 | $213,400 | $10,000 | 4.69% |
| 1954 | | VERTICAL MOVEMENT TOTAL | **$223,400** | **$213,400** | **$10,000** | **4.69%** |
| 1955 | | | | | | |
| 1956 | D20 | PLUMBING | | | | |
| 1957 | | Plumbing | $2,126,673 | $2,126,673 | $0 | 0.00% |
| 1958 | | PLUMBING TOTAL | **$2,126,673** | **$2,126,673** | **$0** | **0.00%** |
| 1959 | | | | | | |
| 1960 | D30 | HVAC | | | | |
| 1961 | | HVAC | $7,879,869 | $7,842,369 | $37,500 | 0.48% |
| 1962 | | HVAC TOTAL | **$7,879,869** | **$7,842,369** | **$37,500** | **0.48%** |
| 1963 | | | | | | |
| 1964 | D40 | FIRE PROTECTION | | | | |
| 1965 | | Fire Protection | $962,994 | $852,994 | $110,000 | 12.90% |
| 1966 | | FIRE PROTECTION TOTAL | **$962,994** | **$852,994** | **$110,000** | **12.90%** |
| 1967 | | | | | | |
| 1968 | D50 | ELECTRICAL | | | | |
| 1969 | | Service and distribution | $5,893,015 | $5,110,258 | $782,757 | 15.32% |
| 1970 | | ELECTRICAL TOTAL | **$5,893,015** | **$5,110,258** | **$782,757** | **15.32%** |
| 1971 | | | | | | |
| 1972 | **D** | **SERVICES TOTAL** | **$17,085,950** | **$16,145,693** | **$940,257** | **5.82%** |
| 1973 | | | | | | |
| 1974 | | | | | | |
| 1975 | ***E*** | ***EQUIPMENT AND FURNISHINGS*** | | | | |
| 1976 | | | | | | |
| 1977 | E10 | EQUIPMENT | | | | |
| 1978 | | Institutional Equipment | $1,759,448 | $1,644,448 | $115,000 | 6.99% |
| 1979 | | EQUIPMENT TOTAL | **$1,759,448** | **$1,644,448** | **$115,000** | **6.99%** |
| 1980 | | | | | | |

# Fuller Middle School

Fuller Middle School

## DIRECT COST SUMMARY - NEW CONSTRUCTION

| | DIV. | ELEMENTS | 90%CD TOTAL | 60%CD TOTAL | DIFFERENCE | % DIFF |
|---|---|---|---|---|---|---|
| | | | 137,385 GSF | 136,600 GSF | 785 GSF | 0.57% |
| 1981 | | | | | | |
| 1982 | E20 | FURNISHINGS | | | | |
| 1983 | | Specialties / Millwork | $1,583,180 | $1,609,546 | ($26,367) | -1.64% |
| 1984 | | FURNISHINGS TOTAL | **$1,583,180** | **$1,609,546** | **($26,367)** | **-1.64%** |
| 1985 | | | | | | |
| 1986 | **D** | **EQUIPMENT AND FURNISHINGS TOTAL** | **$3,342,628** | **$3,253,994** | **$88,634** | **2.72%** |
| 1987 | | | | | | |
| 1988 | | | | | | |
| 1989 | ***F*** | ***SPECIAL CONSTRUCTION & DEMO*** | | | | |
| 1990 | | | | | | |
| 1991 | F10 | SPECIAL CONSTRUCTION | | | | |
| 1992 | | Special construction | $0 | $0 | $0 | 0.00% |
| 1993 | | SPECIAL CONSTRUCTION TOTAL | **$0** | **$0** | **$0** | **0.00%** |
| 1994 | | | | | | |
| 1995 | F20 | SELECTIVE DEMOLITION | | | | |
| 1996 | | Selectice Demolition | $0 | $0 | $0 | 0.00% |
| 1997 | | SELECTIVE DEMOLITION TOTAL | **$0** | **$0** | **$0** | **0.00%** |
| 1998 | | | | | | |
| 1999 | **D** | **SPECIAL CONSTRUCTION & DEMO TOTAL** | **$0** | **$0** | **$0** | **$0** |
| 2000 | | | | | | |
| 2001 | **G** | **EQUIPMENT AND FURNISHINGS TOTAL** | **$5,013,942** | **$4,880,991** | **$132,951** | **2.72%** |
| 2002 | | | | | | |
| 2003 | **A-G** | **BUILDING TOTAL** | **$42,543,873** | **$46,962,817** | **($4,418,943)** | **-9.41%** |
| 2004 | | | | | | |
| 2005 | | | | | | |
| 2006 | ***G*** | ***BUILDING SITEWORK*** | | | | |
| 2007 | | | | | | |
| 2008 | G10 | G10 SITE PREPARATION | | | | |
| 2009 | | G1010 Site Clearing | $0 | $0 | $0 | |
| 2010 | | G1020 Site Demolition and Relocation | $0 | $0 | $0 | |
| 2011 | | G1030 Site Earthwork | $0 | $281,158 | ($281,158) | -100.00% |
| 2012 | | G10 SITE PREPARATION TOTAL | **$0** | **$281,158** | **($281,158)** | **-100.00%** |
| 2013 | | | | | | |
| 2014 | G20 | G20 SITE IMPROVEMENTS | | | | |
| 2015 | | G2020 Roadways | $0 | $0 | $0 | |
| 2016 | | G2030 Pedestrian Paving | $16,675 | $227,154 | ($210,479) | -92.66% |
| 2017 | | G2040 Site Development | $340,500 | $975,872 | ($635,372) | -65.11% |
| 2018 | | G2050 Landscaping | $1,044,545 | $826,078 | | 100.00% |
| 2019 | | G20 SITE IMPROVEMENTS TOTAL | **$1,401,720** | **$2,029,104** | **($845,851)** | **-41.69%** |
| 2020 | | | | | | |
| 2021 | G30 | G30 SITE CIVIL/MECHANICAL UTILITIES | | | | |
| 2022 | | G3010 Water Supply | $0 | $0 | $0 | |
| 2023 | | G3020 Sanitary Sewer | $0 | $0 | $0 | |

# *Fuller Middle School*

Fuller Middle School

## *DIRECT COST SUMMARY - NEW CONSTRUCTION*

| | DIV. | ELEMENTS | 90%CD TOTAL | 60%CD TOTAL | DIFFERENCE | % DIFF |
|---|---|---|---|---|---|---|
| | | | 137,385 GSF | 136,600 GSF | 785 GSF | 0.57% |
| 2024 | | G3030 Storm Sewer | $0 | $0 | $0 | |
| 2025 | | G3040 Heating Distribution | $0 | $0 | $0 | |
| 2026 | | G30 SITE CIVIL/MECHANICAL UTILITIES TOTAL | **$0** | **$0** | **$0** | |
| 2027 | | | | | | |
| 2028 | G40 | G40 SITE ELECTRICAL UTILITIES | | | | |
| 2029 | | G4010 Site Electrical Utilities | $0 | $476,743 | ($476,743) | -100.00% |
| 2030 | | G40 SITE ELECTRICAL UTILITIES TOTAL | **$0** | **$476,743** | **($476,743)** | **-100.00%** |
| 2031 | | | | | | |
| 2032 | BP | BID PACKAGES | | | | |
| 2033 | | BP#1 (Main Summary) | **$0** | **INCLUDED** | **$0** | 100.00% |
| 2034 | | BP#2 (Main Summary) | **$0** | | | |
| 2035 | | BID PACKAGES TOTAL | **$0** | | | **100.00%** |
| 2036 | | | | | | |
| 2037 | **G** | **BUILDING SITEWORK TOTAL** | **$1,401,720** | **$2,787,005** | **($1,603,752)** | **-57.54%** |
| 2038 | | | | | | |
| 2039 | | | | | | |
| 2040 | | **CONSTRUCTION TRADE TOTAL** | **$43,945,593** | **$49,749,822** | **($6,022,695)** | **-12.11%** |
| 2041 | | | | | | |
| 2042 | | Demolish Existing Building | $1,465,500 | $1,465,500 | $0 | 0.00% |
| 2043 | | Hazardous Waste Abatement (Budget provided) | $1,294,490 | $1,384,630 | ($90,140) | -6.51% |
| 2044 | | Design and Pricing Contingency | $1,401,167 | $2,629,998 | ($1,228,831) | -46.72% |
| 2045 | | | | | | |
| 2046 | | **Building Cost** | **$48,106,750** | **$55,229,950** | **($5,690,064)** | **-10.30%** |
| 2047 | | | | | | |
| 2048 | | Escal. to Midpoint of Construction (June '20 Start) | $481,068 | $828,449 | ($347,381) | -41.93% |
| 2049 | | **Trade Cost SubTotal** | **$48,587,818** | **$56,058,399** | **($7,968,175)** | **-14.21%** |
| 2050 | | | | | | |
| 2051 | | General Conditions | $2,931,033 | $3,401,447 | ($470,414) | -13.83% |
| 2052 | | General Requirements | $2,289,380 | $2,652,483 | ($363,103) | -13.69% |
| 2053 | | Builder's Risk | $0 | $0 | $0 | |
| 2054 | | Traffic mitigation | $0 | $0 | $0 | |
| 2055 | | SDI | $269,858 | $360,000 | ($90,142) | -25.04% |
| 2056 | | Sub Bonds | $403,034 | $410,000 | ($6,966) | -1.70% |
| 2057 | | General Liability Insurance | $576,109 | $668,571 | ($92,462) | -13.83% |
| 2058 | | Performance & Payment Bond | $0 | $0 | $0 | |
| 2059 | | Construction Contingency | $1,376,431 | $1,401,460 | ($25,029) | -1.79% |
| 2060 | | CM Fee | $1,152,218 | $1,337,143 | ($184,925) | -13.83% |
| 2061 | | | | | | |
| 2062 | | | | $10,957,843 | | |
| 2063 | | | | | | |
| 2064 | | **Estimated Construction Cost Total** | **$77,231,769** | **$77,247,346** | **($15,577)** | **-0.02%** |
| 2065 | | | | | | |

### 2.3.6 Reconciled Cost Estimate - OPM

Attached is the reconciled OPM Cost Estimate and Cost Estimate Comparison Spreadsheet.

A.M. Fogarty
& Assoc., Inc.
175 Derby St., Suite 5, Hingham, MA 02043
TEL: (781) 749-7272 • FAX: (781) 740-2652
ptim@amfogarty.com
"Construction Cost Consultants"

# 90% Construction Documents
# Fuller Middle School
# Framingham, MA

9-Oct-19

| | | |
|---|---|---|
| BUILDING AND SITEWORK | | $57,595,405 |
| EARLY SITE PACKAGE #1 | | $10,957,843 |
| EARLY SITE PACKAGE #2 | | $8,738,801 |
| | BUT OUT CREDIT | ($50,755) |
| | TOTAL CONSTRUCTION COST | $77,241,293 |

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# 90% Construction Documents
# Fuller Middle School
# Framingham, MA

**9-Oct-19**

| | | | | |
|---|---|---|---|---|
| NEW BUILDING | | | | $42,898,538 |
| SITEWORK | | | | $1,380,102 |
| BUILDING DEMOLITION | 196,000 | GSF | $6.98 | $1,367,800 |
| ASBESTOS REMOVAL ( Consigli sub ) | | | | $1,602,280 |
| TOTAL DIRECT COST ( estimated to the mid-point of construction ) | | | | $47,248,720 |
| Chapter 149 a: | | | | |
| DESIGN CONTINGENCY | | 3.0% | | $1,417,462 |
| CM CONTINGENCY | | 2.5% | | $1,216,655 |
| ESCALATION ( bid 12/19 ) | | 1.0% | | $498,828 |
| SDI | | | | $265,000 |
| SUB BOND | | inc. w/ trade | | |
| GENERAL REQUIREMENTS | | | | $2,289,380 |
| GENERAL CONDITIONS | | | | $2,931,033 |
| TRAFFIC MITIGATION | | | | $0 |
| BUILDING PERMIT | | waived | | |
| GENERAL LIABILITY INSURANCE | | | | $576,109 |
| FEE | | | | $1,152,218 |
| TOTAL CONSTRUCTION COST | | | | $57,595,405 |
| COST PER S.F. | | | | $421.64 |

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| | | |
|---|---|---|
| EARLY SITE PACKAGE #1 | | $8,711,049 |
| TOTAL DIRECT COST ( estimated to the mid-point of construction ) | | $8,711,049 |
| Chapter 149 a: | | |
| SDI | | $120,894 |
| CM CONTINGENCY | 2.5% | $220,799 |
| ESCALATION ( bid 12/19 ) | 2% | $0 |
| GENERAL REQUIREMENTS | | $432,020 |
| GENERAL CONDITIONS | | $586,777 |
| BUILDERS RISK | | $115,218 |
| GENERAL LIABILITY INSURANCE | | $111,429 |
| P&P BOND | | $436,800 |
| FEE | | $222,857 |
| TOTAL CONSTRUCTION COST | | $10,957,843 |

| | | |
|---|---|---|
| EARLY SITE PACKAGE #2 | | $7,339,465 |
| TOTAL DIRECT COST ( estimated to the mid-point of construction ) | | $7,339,465 |
| Chapter 149 a: | | |
| SDI | | $102,386 |
| CM CONTINGENCY | 2.5% | $186,046 |
| GENERAL REQUIREMENTS | | $363,102 |
| GENERAL CONDITIONS | | $470,414 |
| BUILDERS RISK | IN BP #1 | $0 |
| GENERAL LIABILITY INSURANCE | | $92,462 |
| P&P BOND | IN BP #1 | $0 |
| FEE | | $184,925 |
| TOTAL CONSTRUCTION COST | | $8,738,801 |

| | | | |
|---|---|---|---|
| PROJECT: | Fuller Middle School | NO. OF SQ. FT.: | 136,600 |
| LOCATION: | Framingham, MA | COST PER SQ. FT.: | $324.15 |
| CLIENT: | SMMA Architects | | |
| DATE: | 09-Oct-19 | | |

SUMMARY

No.: 18020

| | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |
|---|---|---|---|
| **DIVISION 02 - EXISTING CONDITIONS** | | | |
| 024117 BUILDING DEMOLITION | 75,000 | 0% | 0.55 |
| 024180 ASBESTOS ABATEMENT | 0 | 0% | 0.00 |
| **DIVISION 03 - CONCRETE** | | | |
| 033000 CAST IN PLACE CONCRETE | 0 | 0% | 0.00 |
| **DIVISION 04 - MASONRY** | | | |
| 042000 UNIT MASONRY* | 2,296,962 | 5% | 16.82 |
| **DIVISION 05 - METALS** | | | |
| 051200 STRUCTURAL STEEL FRAMING | 0 | 0% | 0.00 |
| 053000 METAL DECKING | 0 | 0% | 0.00 |
| 054000 COLD FORMED METAL FRAMING | 0 | 0% | 0.00 |
| 055000 METAL FABRICATIONS* | 1,162,710 | 3% | 8.51 |
| **DIVISION 06 - WOOD, PLASTICS & COMPOSITES** | | | |
| 061000 ROUGH CARPENTRY | 0 | 0% | 0.00 |
| 062000 FINISH CARPENTRY | 2,078,706 | 5% | 15.22 |
| **DIVISION 07 - THERMAL & MOISTURE PROTECTION** | | | |
| 071000 DAMPPROOF., WATERPROOF. & CAULKING* | 761,028 | 2% | 5.57 |
| 070002 ROOFING AND FLASHING* | 1,541,922 | 3% | 11.29 |
| 072100 THERMAL INSULATION | 0 | 0% | 0.00 |
| 072600 VAPOR RETARDERS | 0 | 0% | 0.00 |
| 074214 EXTERIOR WALL PANELS | 1,155,569 | 3% | 8.46 |
| 078100 FIREPROOFING | 381,208 | 1% | 2.79 |
| 078400 FIRESTOPPING | 0 | 0% | 0.00 |
| 079513 EXPANSION JOINTS (NO SPEC) | 40,000 | 0% | 0.29 |

| | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |
|---|---|---|---|
| **DIVISION 08 - OPENINGS** | | | |
| 080001 METAL WINDOWS* | 2,270,752 | 5% | 16.62 |
| 080002 GLASS AND GLAZING* | 882,247 | 2% | 6.46 |
| 081113 HOLLOW METAL DOORS & FRAMES | 136,485 | 0% | 1.00 |
| 081416 FLUSH WOOD DOORS | 159,225 | 0% | 1.17 |
| 083100 ACCESS DOORS AND PANELS | 30,000 | 0% | 0.22 |
| 083323 SPECIAL DOORS | 80,793 | 0% | 0.59 |
| 084513 STRUCT-POLYCARBONATE PNL ASSEMB. & SKYLIG | 14,350 | 0% | 0.11 |
| 087100 DOOR HARDWARE | 366,760 | 1% | 2.68 |
| 089000 LOUVERS & VENTS | 84,000 | 0% | 0.61 |
| **DIVISION 09 - FINISHES** | | | |
| 090003 TILE* | 229,896 | 1% | 1.68 |
| 090006 RESILIENT FLOORING* | 868,464 | 2% | 6.36 |
| 090009 PAINTING* | 547,406 | 1% | 4.01 |
| 092116 GYPSUM WALLBOARD ASSEMBLIES | 5,724,632 | 13% | 41.91 |
| 095100 ACOUSTICAL CEILINGS* | 932,456 | 2% | 6.83 |
| 096446 WOOD & ATHLETIC FLOORING | 225,065 | 1% | 1.65 |
| 096712 RESINOUS FLOORING | 109,314 | 0% | 0.80 |
| 096800 CARPET | 8,456 | 0% | 0.06 |
| 097217 DIGITAL IMAGE WALL COVERINGS | 0 | 0% | 0.00 |
| 097233 DRY-ERASE WALL COVERING | 0 | 0% | 0.00 |
| 097733 SANITARY WALL PANELS | 0 | 0% | 0.00 |
| 098100 ACOUSTICAL INSULATION | 0 | 0% | 0.00 |
| 098400 ACOUSTIC ROOM COMPONENTS | 0 | 0% | 0.00 |
| 098415 WOOD FIBER ACOUSTICAL PANELS | 0 | 0% | 0.00 |
| **DIVISION 10 - SPECIALTIES** | | | |
| 101100 MARKERBOARDS & TACKBOARDS | 180,800 | 0% | 1.32 |
| 101400 SIGNAGE | 68,144 | 0% | 0.50 |
| 102113 TOILET COMPARTMENTS | 55,590 | 0% | 0.41 |
| 102600 WALL AND DOOR PROTECTION | 10,000 | 0% | 0.07 |
| 102813 TOILET ACCESSORIES | 35,127 | 0% | 0.26 |
| 104000 SAFETY SPECIALTIES | 22,800 | 0% | 0.17 |
| 107113 EXTERIOR SUN CONTOL DEVICES | 0 | 0% | 0.00 |
| 109000 MISCELLANEOUS SPECIALTIES | 710,940 | 2% | 5.20 |
| **DIVISION 11 - EQUIPMENT** | | | |
| 113100 RESIDENTIAL APPLIANCES | 10,350 | 0% | 0.08 |
| 114000 FOOD SERVICE EQUIPMENT | 415,270 | 1% | 3.04 |
| 115213 PROJECTION SCREENS | 65,000 | 0% | 0.48 |
| 116143 THEATRICAL EQUIPMENT(No Spec) | 866,921 | 2% | 6.35 |
| 116600 ATHLETIC & SPORTS EQUIPMENT | 102,621 | 0% | 0.75 |
| 119000 MISC. EQUIPMENT | 32,500 | 0% | 0.24 |
| | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |

| | | | |
|---|---|---|---|
| **DIVISION 12 - FURNISHINGS** | | | |
| 122400 WINDOW SHADES | 136,136 | 0% | 1.00 |
| 122414 MOTORIZED WINDOW SHADES | 0 | 0% | 0.00 |
| 123553 CASEWORK | 323,013 | 1% | 2.36 |
| 124813 FLOOR MATS | 7,920 | 0% | 0.06 |
| 124816 ENTRANCE GRILLES & FRAMES | 0 | 0% | 0.00 |
| 126613 TELESCOPING BLEACHERS | 81,250 | 0% | 0.59 |
| 129000 MISCELLANEOUS FURNISHING | 106,445 | 0% | 0.78 |
| **DIVISION 13 - SPECIAL CONSTRUCTION** | | | |
| 130000 SPECIAL CONSTRUCTION | 0 | 0% | 0.00 |
| **DIVISION 14 - CONVEYING EQUIPMENT** | | | |
| 140001 ELEVATORS* | 212,000 | 0% | 1.55 |
| **DIVISION 21 - FIRE SUPPRESSION** | | | |
| 210001 FIRE SUPPRESSION* | 893,565 | 2% | 6.54 |
| **DIVISION 22 - PLUMBING** | | | |
| 220001 PLUMBING* | 2,150,852 | 5% | 15.75 |
| **DIVISION 23 - HVAC** | | | |
| 230001 HVAC* | 8,247,841 | 19% | 60.38 |
| **DIVISION 26 - ELECTRICAL** | | | |
| 260001 ELECTRICAL* | 6,000,049 | 14% | 43.92 |
| **DIVISION 31 - EARTHWORK** | | | |
| 310000 EARTHWORK | 0 | 0% | 0.00 |
| 311000 SITE PREPARATION & CLEARING | 0 | 0% | 0.00 |
| **DIVISION 32 - EXTERIOR IMPROVEMENTS** | | | |
| 321000 PAVEMENT, CURBING & EDGING | 0 | 0% | 0.00 |
| 323100 SITE IMPROVEMENTS | 271,675 | 1% | 1.99 |
| 328000 IRRIGATION | 165,792 | 0% | 1.21 |
| 329000 LANDSCAPING | 942,635 | 2% | 6.90 |
| **DIVISION 33 - UTILITIES** | | | |
| 330000 UTILITIES | 0 | 0% | 0.00 |
| | --- | | |
| DIRECT COST | 44,278,640 | 100% | 324.15 |

*DENOTES FILED SUB-BID

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 02 - EXISTING CONDITIONS | | | | |
| 024117 BUILDING DEMOLITION | SEE SUMMARY | | | |
| Staged Floor at Aud | 1 | LS | 75,000.00 | 75,000 |
| | | | | 75,000 |
| 024180 ASBESTOS ABATEMENT | SEE SUMMARY | | | |
| | | | | 0 |
| DIVISION 03 - CONCRETE | | | | |
| 033000 CAST IN PLACE CONCRETE | SEE BID PACKAGE #2 | | | |
| | | | | 0 |
| DIVISION 04 - MASONRY | | | | |
| 042000 UNIT MASONRY* | | | | |
| Exterior Walls: | | | | |
| Backup : | | | | |
| Gym 12" CMU Back-up - Exposed | 7,497 | SF | 25.50 | 191,174 |
| Aud 12" CMU Back-up - Exposed | 7,342 | SF | 25.50 | 187,221 |
| Int GF finish premium | 7,342 | SF | 5.50 | 40,381 |
| *A462 GF is not noted | | | | |
| Masonry Veneer Building ( QTY Noted): | | | | |
| 4x4x12 Scored brick veneer | 6,252 | SF | 34.00 | 212,568 |
| 4x8x8 Scored brick veneer | 6,722 | SF | 36.00 | 241,992 |
| 4x8x16 Scored ground face CMU | 23,500 | SF | 31.00 | 728,500 |
| 4x4x12 Scored ground face CMU | 3,512 | SF | 33.50 | 117,652 |
| 3" Mineral fiber insul @ masonry | 43,331 | SF | 3.72 | 161,191 |
| A501 Premium: | | | | |
| Sill brick | | w/Unit Cost | | |
| Lip brick | | w/Unit Cost | | |
| Temporary shoring at CMU Bearing | 1 | LS | 100,000.00 | 100,000 |
| SS Masonry flashing | 1 | LS | 35,000.00 | 35,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Staging | | inc. w/ unit | | |
| Precast Concrete: | | | | |
| Misc. BLDG precast veneer | | N/A | | |
| *Site planters are included w/ site improvements | | | | |
| 2nd Floor Main Entry Terrace: | | | | |
| (3/ A316)3'6"H Brick Partial HT wall-com | 26 | LF | 440.00 | 11,440 |
| (3/ A316) Wall Cap | 26 | LF | 175.00 | 4,550 |
| Partitions: | | | | |
| Interior 12" CMU Partition: | | | | |
| Gym - 28' | 4,480 | SF | 29.00 | 129,920 |
| Auditorium - 28' | 2,660 | SF | 29.00 | 77,140 |
| Auditorium - 14' | 420 | SF | 26.00 | 10,920 |
| GF CMU - Aud. Only | 2,660 | SF | 4.50 | 11,970 |
| Acoustical Block - Premium | 1,000 | SF | 6.50 | 6,500 |
| Stage front CMU pier (5 loc) | 22.5 | SF | 55.00 | 1,238 |
| Int GF finish premium | 5,740 | SF | 4.50 | 25,830 |
| CMU Partition (Gym & Aud): | | | | |
| Bond beam | 37 | LF | 48.00 | 1,776 |
| | | | | 2,296,962 |

DIVISION 05 - METALS

051200 STRUCTURAL STEEL FRAMING

SEE BID PACKAGE #2

0

053000 METAL DECKING

SEE BID PACKAGE #2

0

054000 COLD FORMED METAL FRAMING

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| *w/ gypsum drywall | | | | |
| | | | | 0 |
| 055000 METAL FABRICATIONS* | | | | |
| Elevators: | | | | |
| Elev. framing | 1 | EA | 3,000.00 | 3,000 |
| Elev. pit ladder | 1 | EA | 1,537.00 | 1,537 |
| Elev. sump grate | 1 | EA | 1,500.00 | 1,500 |
| Exterior Walls: | | | | |
| 42" Perf Metal Guardrail: | | | | |
| LVL 2 entry | 11 | LF | 350.00 | 3,850 |
| LVL 2 emerg. egress | 42 | LF | 350.00 | 14,700 |
| LVL 2 emerg. egress stair wall rail | 8 | LF | 145.00 | 1,160 |
| Galv, loose lintel (per 5600-604) | 133 | LF | 36.00 | 4,788 |
| Misc metals @ ext wall - allow | 1 | LS | 25,000.00 | 25,000 |
| Reliving angle | | W /Structural | | |
| Bolted galv. sill angle @ fnd | | W /Structural | | |
| Support clip @ skylight curb (spec) | 567 | LF | 125.00 | 70,875 |
| Exterior Doors: | | | | |
| OH door frame @: | | | | |
| Tech-Makerspace | 1 | EA | 500.00 | 500 |
| Special Doors: | | | | |
| LVL 1 Corridor Security Gate- sgl ( 7' x7'1 | 2 | EA | 7,000.00 | 14,000 |
| Partitions: | | | | |
| Folding Panel partition Support (18/A620): | | | | |
| Typ classroom (13 EA) | 208 | LF | w/ pacakge #2 | |
| Music classroom (DBL panel 1 EA) | 19 | LF | w/ pacakge #2 | |
| SPED suite (3 EA) | 120 | LF | w/ pacakge #2 | |
| Folding Grille Support @: | | | | |
| Learning common | 46 | LF | 200.00 | 9,200 |
| Sgl custom security gate (7'w) | 2 | EA | 4,000.00 | 8,000 |
| Coiling Grille Support @: | | | | |
| Servery | 35 | LF | 100.00 | 3,500 |
| Main office(1 EA) | 21 | LF | 100.00 | 2,100 |
| CMU Partition (Gym & Aud): | | | | |
| CMU clip @ 4' oc | 70 | EA | 115.00 | 8,050 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Misc Metals @ Corridor Locker Enclosure (nic mtl locker) - allow (7/A650): | | | | |
| 1st Floor (307 LF) | | N/A | | |
| Upper floors | | w/ package #2 | | |
| Misc. metals | 136,600 | GSF | 1.00 | 136,600 |
| 1/4" Stl plate @ tile - 6" w (10/A620) | 1 | LS | 15,000.00 | 15,000 |
| Fittings: | | | | |
| Auditorium: | | | | |
| Stage front access stair rails (9/A602) | 32 | LF | 145.00 | 4,640 |
| Aisle access stair rails (11/A602) | 34 | LF | 145.00 | 4,930 |
| Auditorium equip. supports | 1 | LS | 15,000.00 | 15,000 |
| Interior Metals: | | | | |
| 1st Flr guard rail (5.39) | 20 | LF | 350.00 | 7,000 |
| 2nd & 3rd Flr Lobby guard rail (6/A650) | 327 | LF | 450.00 | 147,150 |
| Cohort # 2059 2nd Flr Lobby guard rail (6 | 19 | LF | 450.00 | 8,550 |
| OT/PT equip support-allow | 1 | RM | 2,500.00 | 2,500 |
| Gym equip supports | 1 | LS | 10,000.00 | 10,000 |
| Concealed stl angle @ corr built-in bench | | W/ Unit Cost | | |
| Concealed stl angle @ casework ctr | | W/ Unit Cost | | |
| Ships ladder @ gym storage | 1 | EA | 15,000.00 | 15,000 |
| Interior: | | | | |
| 4/ A601 Curved perf arch grille - classroom | 1,536 | SF | 50.00 | 76,800 |
| Support atrium vert duct encl. | 4 | LOC | 10,000.00 | 40,000 |
| Exterior Rails: | | | | |
| Roof ladder (3 EA) | 30 | VLF | 425.00 | 12,750 |
| Loading dock stair/ramp guardrail | 15 | LF | 265.00 | 3,975 |
| Loading dock stair/ramp wall rail | 15 | LF | 150.00 | 2,250 |
| 2nd flr entry terrace guardrail | 30 | LF | 500.00 | 15,000 |
| High roof safety rail - allow | 150 | LF | 125.00 | 18,750 |
| Stair Construction: | | | | |
| 5' 6"W Metal Pan Stair #3 @ Learning Commons 1st- 2nd (1 FLT): | | | | |
| Metal pan stair treads/risers | 132 | LFR | 95.00 | 12,540 |
| Metal pan landing | 33 | SF | 75.00 | 2,475 |
| Guardrail | 66 | LF | 400.00 | 26,400 |
| Cane rail | 1 | EA | 1,350.00 | 1,350 |
| 8'6" W Metal Pan Stair #14 @ Learning Commons 1st- 2nd ( 1 FLT): | | | | |
| Metal pan stair treads/risers | 204 | LFR | 95.00 | 19,380 |
| Metal pan landing | 51 | SF | 75.00 | 3,825 |
| Guardrail | 66 | LF | 400.00 | 26,400 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Cane rail | 1 | EA | 1,350.00 | 1,350 |
| 5'10" W Metal Pan Stair #6 @ Learning Commons 2nd - 3rd( 1 FLT): | | | | |
| Metal pan stair treads/risers | 138 | LFR | 95.00 | 13,110 |
| Metal pan landing | 33 | SF | 75.00 | 2,475 |
| Guardrail | 66 | LF | 400.00 | 26,400 |
| 8' 6"W Metal Pan Stair #5 @ Learning Commons 2nd - 3rd(1 FLT): | | | | |
| Metal pan stair treads/risers | | w/ package #2 | | |
| Metal pan landing | | w/ package #2 | | |
| Guardrail | 66 | LF | 400.00 | 26,400 |
| 5' W Metal Pan Stair Hall 1 & 2 ( 2 loc 1st - 3rd 4 FLT): | | | | |
| Metal pan stair treads/risers | 480 | LFR | 95.00 | 45,600 |
| Metal pan landing | 240 | SF | 75.00 | 18,000 |
| Wall rail | 128 | LF | 165.00 | 21,120 |
| Guardrail | 128 | LF | 400.00 | 51,200 |
| Guardrail flr open | 12 | LF | 400.00 | 4,800 |
| Cane rail | 2 | EA | 1,350.00 | 2,700 |
| 5' W Metal Pan Stair @ #1 Penthouse ( 1 FLT): | | | | |
| Metal pan stair treads/risers | 120 | LFR | 95.00 | 11,400 |
| Metal pan landing | 60 | SF | 75.00 | 4,500 |
| Wall rail | 32 | LF | 165.00 | 5,280 |
| Guardrail | 32 | LF | 400.00 | 12,800 |
| Access gate | 1 | EA | 1,800.00 | 1,800 |
| Ceiling Finishes: | | | | |
| Note #5.55 Perf Arch Grille: | | | | |
| 3rd Flr clg -12"W | 210 | SF | 200.00 | 42,000 |
| Site Development: | | | | |
| Ramp and Planter Walls: | | | | |
| Railings | 146 | LF | 250.00 | 36,500 |
| Site Stair: | | | | |
| Site stair railing | 33 | LF | 250.00 | 8,250 |
| Site decorative bollard | | deleted | | |
| Stage Plenum (7/A602): | | | | |
| Perf. arch grille - stage front | 120 | SF | 225.00 | 27,000 |
| | | | | 1,162,710 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 06 - WOOD, PLASTICS & COMPOSITES | | | | |
| 061000 ROUGH CARPENTRY | | | | |
| | | | | 0 |
| 062000 FINISH CARPENTRY | | | | |
| Exterior Walls: | | | | |
| Main Entry LVL 2: | | | | |
| Wd bench @ precast planter | 24 | LF | 550.00 | 13,200 |
| Phenolic bench @ col. M | 7 | LF | 500.00 | 3,500 |
| Partitions: | | | | |
| Interior Borrowed Light Window /Sidelight-A620 (NIC Break out Area): | | | | |
| PTD MDF sill 9" | 866 | LF | 32.00 | 27,712 |
| PTD MDF head 9" | 866 | LF | 25.00 | 21,650 |
| PTD MDF jamb 9" | | N/A | | |
| Fittings: | | | | |
| Finish Carpentry: | | | | |
| A312 Int window panel grilles (Rulon) | 450 | LF | 150.00 | 67,500 |
| *casework is included w/ E2010 | | | | |
| Wall Finishes: | | | | |
| (16/A621) 18" PTD MDF Bumper w/HD Bamboo Wd Marker Tray: | | | | |
| Bumper Rail | 3,480 | LF | 45.00 | 156,600 |
| Bumper Top | 3,480 | LF | 30.00 | 104,400 |
| Wall Finish: | | | | |
| P.lam Wall Panel: | | | | |
| 11/A600 Drinking Fountain Alcove (7 loc | 245 | SF | 55.00 | 13,475 |
| P.Lam wall panel @ class entry controls | 59 | LOC | 550.00 | 32,450 |
| Auditorium vestibule | 393 | SF | 48.00 | 18,864 |
| Stage full ht | 2,880 | SF | 48.00 | 138,240 |
| Ceiling Finishes: | | | | |
| Auditorium/Stage-(A461 & A691): | | | | |
| Clouds - allow | 2,076 | SF | 120.00 | 249,120 |
| *Clouds 3/4" Veneer w/wood trim - includes hardware and hangers | | | | |
| Utility & closet shelving | 1 | LS | 10,000.00 | 10,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Solid surface lav ctr | 243 | LF | 265.00 | 64,395 |
| Display Case ( 6/A401) | 18 | LF | 1,000.00 | 18,000 |
| Art recess corridor #2000 | 1 | LS | 15,000.00 | 15,000 |
| Classroom Entry: | | | | |
| Corridor built-in bench A621 4'w | 212 | LF | 400.00 | 84,800 |
| Framing and Blocking: | | | | |
| Corridor Locker Enclosure (nic mtl locker) - allow (7/A650): | | | | |
| Freestanding - 1st flr | 307 | LF | 320.00 | 98,240 |
| Freestanding - upper flr | 724 | LF | 320.00 | 231,680 |
| Main Office 2nd Floor: | | | | |
| P. lam Radial Reception counters | 20 | LF | 650.00 | 13,000 |
| Radial work island /work table | 38 | SF | 165.00 | 6,270 |
| Reception work ctr | 10 | LF | 325.00 | 3,250 |
| Tall storage unit 4' | 3 | EA | 1,650.00 | 4,950 |
| Mail unit wall cab | 16 | LF | 750.00 | 12,000 |
| Mail area work ctr | 16 | LF | 250.00 | 4,000 |
| Mobile storage cab (36"x27"h) | | w/ ffe | | |
| Copier area work ctr | 16 | LF | 250.00 | 4,000 |
| Large conf base cab w/ctr | 15 | LF | 450.00 | 6,750 |
| Work space work ctr | 16 | LF | 250.00 | 4,000 |
| Library / Media Center (1 EA): | | | | |
| P. lam circulation desk - radial | 11 | LF | 1,200.00 | 13,200 |
| Book shelving sys - free standing | | NIC | | |
| 8'6" Book shelving sys-perm fixed unit | 39 | LF | 500.00 | 19,500 |
| P. lam work ctr | 27 | LF | 175.00 | 4,725 |
| Mobile storage cab (36"x27"h) | | w/ ffe | | |
| 30" P. lam work ctr | 33 | LF | 220.00 | 7,260 |
| Art Class Room (1 EA): | | | | |
| 3' Tall storage cab | 4 | EA | 1,550.00 | 6,200 |
| Tech-Makerspace ( 1 EA): | | | | |
| 30" P. lam counter w/backsplash(no base c | 10.5 | LF | 230.00 | 2,415 |
| Mobile storage cab (36"x27"h) | | w/ ffe | | |
| 24" P. lam back splash | 21 | SF | 25.00 | 525 |
| 4 Tier shelving unit | 3 | LF | 400.00 | 1,200 |
| (6.81) Shadow relief | 2 | EA | 450.00 | 900 |
| Fab-lab ( 1 EA): | | | | |
| P.lam Counter | 13.5 | LF | 230.00 | 3,105 |
| Mobile storage cab (36"x27"h) | | w/ ffe | | |
| 24" P. lam back splash | 27 | SF | 25.00 | 675 |
| 4 Tier shelving unit | 3 | LF | 400.00 | 1,200 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| (6.81) Shadow relief 3D mdo | 2 | EA | 450.00 | 900 |
| Class Closet ( 34 EA): | | | | |
| 12" MDO lowest Shelf w/ framing (4'6"/LC | 153 | LF | 45.00 | 6,885 |
| 12" Shelving (4 tier- 18'/loc) | 612 | LF | 42.00 | 25,704 |
| Teacher Prep Room (24 EA): | | | | |
| P Lam ctr w/ wd edge ( 11'/loc) | | N/A | | |
| 12" MDO lowest Shelf w/ framing (9' LOC | 216 | LF | 45.00 | 9,720 |
| 12" Shelving (4 tier- 36'/loc) | 864 | LF | 42.00 | 36,288 |
| Typ, SPED & ELL Classroom (32 EA - A410): | | | | |
| 30" P Lam ctr w/ wd edge ( 12' 6"/loc) | 400 | LF | 275.00 | 110,000 |
| 30" P Lam flip top ctr w/ wd edge ( 3'/loc) | 96 | LF | 325.00 | 31,200 |
| Mobile storage cab (36"wx27"h 3/RM) | | w/ ffe | | |
| 4 tier shelving unit (10' /loc) | 320 | LF | 400.00 | 128,000 |
| (6.81) Shadow relief 3D mdo (3/rm) | 96 | EA | 450.00 | 43,200 |
| Music Classroom ( 2 EA): | | | | |
| 30" P Lam ctr w/ wd edge | 26 | LF | 275.00 | 7,150 |
| Mobile storage cab (36"wx27"h 2/RM) | | w/ ffe | | |
| Ext wall 4 tier shelving unit 8'6" - (1/loc) | 17 | LF | 400.00 | 6,800 |
| (6.81) Shadow relief 3D mdo (2/rm) | 4 | EA | 450.00 | 1,800 |
| Drama Classroom ( 1 EA): | | | | |
| 30" P Lam ctr w/ wd edge | 16 | LF | 275.00 | 4,400 |
| 24" P.lam backsplash | 32 | SF | 25.00 | 800 |
| Mobile storage cab (36"wx27"h) | | w/ ffe | | |
| SPED Classroom #1260 ( Additional casework 1 EA): | | | | |
| Sink ctr w/skirt | 6 | LF | 300.00 | 1,800 |
| 24" P.lam backsplash | 17 | SF | 25.00 | 425 |
| SPED Classroom #2260 ( Additional casework 1 EA): | | | | |
| 42" Wall cab | 15 | LF | 225.00 | 3,375 |
| Sink ctr w/skirt | 15 | LF | 300.00 | 4,500 |
| 20" P.lam backsplash | 25 | SF | 25.00 | 625 |
| Staff Lunch Room ( 1 EA): | | | | |
| Base cab w/p.lam ctr | 7.5 | LF | 425.00 | 3,188 |
| Custodian Office (1 EA): | | | | |
| Work ctr | 9 | LF | 165.00 | 1,485 |
| Medical Suite (A425): | | | | |
| Work ctr | 15 | LF | 165.00 | 2,475 |
| Wall cab | 8 | LF | 200.00 | 1,600 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Open wall cab | 7 | LF | 225.00 | 1,575 |
| Microwave shelf | 3 | LF | 225.00 | 675 |
| Aud Dressing room (2 EA): | | | | |
| P.lam counter w/ backsplash(no base cab) | 38 | LF | 225.00 | 8,550 |
| Auditorium: | | | | |
| P.lam AV ctr | 9 | LF | 165.00 | 1,485 |
| P.lam projector support | 1 | LOC | 1,500.00 | 1,500 |
| P lam low wall @ seating complete | 89 | LF | 475.00 | 42,275 |
| Guidance Suite (3 Loc): | | | | |
| Base cab w/ctr | 8 | LF | 350.00 | 2,625 |
| Wall cab | 15 | LF | 210.00 | 3,150 |
| Misc. Casework Allowance: | | | | |
| Misc Display Cases (19/A621) | 1 | LS | 20,000.00 | 20,000 |
| Trash/ recycle ctr - allow | 1 | EA | 10,000.00 | 10,000 |
| Cororridor bench | 34 | LF | 600.00 | 20,400 |
| Kit. serving ctr (4/603) | w/ food service | | | |
| *Counter tops include manufactures wall brackets | | | | |
| Window Sill | 1,100 | LF | 42.00 | 46,200 |
| | | | | 2,078,706 |

DIVISION 07 - THERMAL & MOISTURE PROTECTION

071000 DAMPPROOF., WATERPROOF. & CAULKING*

| | | | | |
|---|---|---|---|---|
| Foundations: | | | | |
| Foundation dampproofing | 6,884 | | w/ package #2 | |
| Retaining wall waterproofing | 1,360 | | w/ package #2 | |
| Elev. pit waterproofing | 1 | | w/ package #2 | |
| Exterior Walls: | | | | |
| Fluid Applied air & vapor barrier: | | | | |
| Exterior Wall - CMU & Sheathing | 59,125 | SF | 8.00 | 473,000 |
| Bay covered entry | 1,119 | SF | 8.00 | 8,952 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Exterior Windows: | | | | |
| Flex flashing - perm | 9,009 | LF | 8.00 | 72,072 |
| Perm Window Caulking | 9,000 | LF | 9.50 | 85,500 |
| Exterior Doors: | | | | |
| Perm. Ext HM & OH opening: | | | | |
| Flex flashing - perm | 348 | LF | 8.00 | 2,784 |
| Exterior sealants - perm. | 348 | LF | 7.50 | 2,610 |
| Partitions: | | | | |
| Joint sealants | 136,600 | GSF | 0.85 | 116,110 |
| | | | | 761,028 |

070002 ROOFING AND FLASHING*

| | | | | |
|---|---|---|---|---|
| Exterior Walls: | | | | |
| (1/A543) Raised Common Exterior Wall: | | | | |
| 5'6"H Rigid Insul. W/ PVC Membrane( sa | 2,486 | SF | 15.00 | 37,290 |
| Roofing (A502): | | | | |
| White 60 mil PVC Roofing w/R-36 (6" Insul ) : | | | | |
| Typ Flat roof | 64,092 | SF | 16.25 | 1,041,495 |
| 1/2 " glass mat cover bd -100% | 64,092 | SF | 1.45 | 92,933 |
| 1/2" glass mat protection bd(nic conc deck | 23,302 | SF | 1.45 | 33,788 |
| 1/2" glass mat protection 2 lyrs aud | 7,563 | SF | 5.20 | 39,328 |
| Poly vapor retarder-100% | 64,092 | SF | 0.42 | 26,919 |
| 3' High Rubber Walkway Pad | 765 | SF | 7.00 | 5,355 |
| Membrane flashing | 64,092 | SF | 0.50 | 32,046 |
| Base flashing | 1,620 | LF | 32.00 | 51,840 |
| Alum Typ roof fascia | 3,182 | LF | 22.00 | 70,004 |
| Expansion joint - allow | 86 | LF | 185.00 | 15,910 |
| Flash gable skylight curb ( 4 EA) | 567 | LF | 32.00 | 18,144 |
| Scupper - allow | 4 | EA | 750.00 | 3,000 |
| Flash roof drain - allow | 32 | EA | 135.00 | 4,320 |
| Entry pier/chimney cap flashing -complete | 55 | SF | 100.00 | 5,500 |
| Premium Terrace Paver Sys (1/A316): | | | | |
| Main entrance #2000 | 730 | SF | 45.00 | 32,850 |

*Includes Sections 075419, 076200, 077236 & 086300

| | | | | |
|---|---|---|---|---|
| Roof Openings: | | | | |
| Roof hatch | 1 | EA | 4,200.00 | 4,200 |
| Stage vent-allow | 2 | EA | 13,500.00 | 27,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | 1,541,922 |
| 072100 THERMAL INSULATION | | | | |
| Slab on Grade: | | | | |
| 2" Rigid Slab Insul.- 4' @ perm. | SEE BID PACKAGE #1 | | | |
| | | | | 0 |
| 072600 VAPOR RETARDERS | | | | |
| *Excludes under slab waterproofing system | | | | |
| | | | | 0 |
| 074214 EXTERIOR WALL PANELS | | | | |
| Exterior Walls: | | | | |
| Exterior Wall Panel System: | | | | |
| Corrugated metal panel | 5,500 | SF | 46.00 | 253,000 |
| Composite metal panel | 2,662 | SF | 50.00 | 133,100 |
| Phenolic panel | 8,518 | SF | 76.00 | 647,368 |
| 8'H Mech roof screen(NIC Struct Frame - 8/A325): | | | | |
| 8' Corrugated Perf Mtl wall panel-complete | 1,112 | SF | 42.00 | 46,704 |
| Screen wall cap - allow | 139 | LF | 30.00 | 4,170 |
| (2 sided) Phenolic fin - complete: | | | | |
| 3' Fin 12'4"H (5 loc) | 200 | SF | 120.00 | 24,000 |
| *Includes Sections 074214 & 074224 | | | | |
| Exterior Walls: | | | | |
| Exterior Wall A501: | | | | |
| 4" Mineral fiber insul @ panel wall | 11,380 | SF | 4.15 | 47,227 |
| | | | | 1,155,569 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 078100 FIREPROOFING | | | | |
| Floor Construction: | | | | |
| Allow: | | | | |
| Spray fireproofing | 68,431 | SF | 3.00 | 205,293 |
| Roof Construction: | | | | |
| Allow: | | | | |
| Spray fireproofing | 36,041 | SF | 2.80 | 100,915 |
| Roof Construction: | | | | |
| Intumescent paint - roof struct. | 1 | LS | 75,000.00 | 75,000 |
| *Exposed structure @ atrium noted | | | | |
| *Includes Section 099646 | | | | |
| | | | | 381,208 |
| 078400 FIRESTOPPING | | | | |
| | | | | 0 |
| 079513 EXPANSION JOINTS (NO SPEC) | | | | |
| Exterior Walls: | | | | |
| Control and expansion joints | 1 | LS | 30,000.00 | 30,000 |
| Partitions: | | | | |
| Int Wall Expansion joints | 1 | LS | 10,000.00 | 10,000 |
| | | | | 40,000 |
| DIVISION 08 - OPENINGS | | | | |
| 080001 METAL WINDOWS* | | | | |
| Exterior Doors: | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Alum. Doors (Incl. Glass, Glazing): | | | | |
| 7' 1st Flr Entry - sgl | 2 | EA | 4,100.00 | 8,200 |
| 7' 1st Flr Entry - dbl | 3 | PR | 8,200.00 | 24,600 |
| 7' 2nd Flr Entry - sgl | 1 | EA | 4,100.00 | 4,100 |
| 7' 2nd Flr Entry - dbl | 1 | PR | 8,200.00 | 8,200 |
| 7' Main office egress - sgl | 1 | EA | 4,100.00 | 4,100 |
| 7' Stair egress - sgl | 2 | EA | 4,100.00 | 8,200 |
| 7' Staff lunch rm | 1 | EA | 4,100.00 | 4,100 |
| 8' Media ctr - sgl | 1 | EA | 4,100.00 | 4,100 |
| Premium : | | | | |
| Auto opener | 3 | EA | 4,500.00 | 13,500 |
| Ext. School Guard (6 lvs ) - Factory glazing | 90 | SF | 36.00 | 3,240 |
| Interior Doors: | | | | |
| Aluminum ( Frame, Door, Glass, Glazing and Hdw): | | | | |
| 7' 1st Flr Entry Vestibule - sgl | 1 | EA | 4,000.00 | 4,000 |
| 7' 1st Flr Entry Vestibule - dbl | 2 | PR | 8,150.00 | 16,300 |
| 8' 2nd Flr Entry Vestibule- sgl | 1 | EA | 4,400.00 | 4,400 |
| 8' 2nd Flr Entry Vestibule - dbl | 1 | PR | 8,600.00 | 8,600 |
| Premium: | | | | |
| Int. School Guard ( 11 lvs ) - Factory glazir | 154 | SF | 36.00 | 5,544 |
| Exterior Windows - Allow: | | | | |
| Storefront | 12,130 | SF | 110.00 | 1,334,300 |
| Exterior sealants - perm. | 9,009 | LF | 7.50 | 67,568 |
| ALLOW: | | | | |
| Security Glazing Film 2nd flr entry | 125 | SF | 36.00 | 4,500 |
| Exterior Wall Mock-up | 1 | LS | 35,000.00 | 35,000 |
| Partitions: | | | | |
| Aluminum Storefront Frame, Glass & Glazing-Allow: | | | | |
| 1st Floor Vestibule (11A/A221) | | w/B2010 | | |
| Office/ vestibule security window (6/A403) | | | | |
| 2nd Flr Main office | 1 | EA | 5,000.00 | 5,000 |
| Roof Openings: | | | | |
| Gable Skylight ( 4 loc) | 4,261 | SF | 150.00 | 639,150 |
| Gable Skylight End wall ( 8 loc) | 427 | SF | 150.00 | 64,050 |
| | | | | 2,270,752 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 080002 GLASS AND GLAZING* | | | | |
| Fittings: | | | | |
| Multi User Toilet & Locker Rm (16 ea): | | | | |
| 5'H mirror @ lav ctr | 1,215 | SF | 38.00 | 46,170 |
| Dressing Rm (2 ea): | | | | |
| 5'H mirror @ ctr | 90 | SF | 38.00 | 3,420 |
| Site Development: | | | | |
| Band Shell (A500): | | | | |
| 9/16 " Temp. lam glazing - roof | 132 | SF | 175.00 | 23,100 |
| 9/16 " Temp. lam glazing - wall | 254 | SF | 175.00 | 44,450 |
| Partitions: | | | | |
| Interior Window /Sidelight-A620 (NIC Break out Area): | | | | |
| SGL Alum channel ,glass & glazing | 5,471 | SF | 62.00 | 339,202 |
| DBL Alum channel ,glass & glazing | 930 | SF | 88.00 | 81,840 |
| GL-Graduated pattern film premium | 3,094 | SF | 10.00 | 30,940 |
| 3m Safety Glazing | 4,332 | SF | 15.00 | 64,980 |
| Interior Doors: | | | | |
| Glass & Glazing @ Interior Wood Door: | | | | |
| Sgl C1 7'H ( 6 EA ) | 60 | SF | 48.00 | 2,880 |
| Sgl C1 8'H ( 105 EA ) | 1,260 | SF | 48.00 | 60,480 |
| Dbl C2 8'H ( 9 EA ) | 216 | SF | 48.00 | 10,368 |
| Dbl C3 8'H ( 1 EA ) | 4 | SF | 48.00 | 192 |
| Breakout Space: | | | | |
| Breakout A( 2 story): | | | | |
| Glass wall w/ perim trim | 377 | SF | 75.00 | 28,275 |
| Breakout B( 2 story): | | | | |
| Glass wall w/ perim trim | 906 | SF | 75.00 | 67,950 |
| Breakout C ( 2 story): | | | | |
| Glass wall w/ perim trim | 677 | SF | 75.00 | 50,775 |
| Breakout D( 1 story): | | | | |
| Glass wall w/ perim trim | 215 | SF | 75.00 | 16,125 |
| Breakout E ( 1 story): | | | | |
| Glass wall w/ perim trim | 148 | SF | 75.00 | 11,100 |
| | | | | 882,247 |
| 081113 HOLLOW METAL DOORS & FRAMES | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Interior Doors: | | | | |
| Int. HM Door Frame: | | | | |
| Single Door 7'H | 22 | EA | 285.00 | 6,270 |
| Double Door 7'H | 1 | EA | 305.00 | 305 |
| Single Door 8' H | 251 | EA | 320.00 | 80,320 |
| Double door 8'H | 26 | EA | 345.00 | 8,970 |
| Int. HM Door: | | | | |
| Sgl B1 7'H | 15 | EA | 495.00 | 7,425 |
| 90 Min Sgl B1 7'H | 1 | EA | 530.00 | 530 |
| Dbl B2 7'H | 1 | EA | 990.00 | 990 |
| Sgl B1 8'H | 25 | EA | 540.00 | 13,500 |
| 90 Min Sgl B1 8'H | 1 | EA | 565.00 | 565 |
| 90 Min Dbl B2 8'H | 3 | EA | 1,130.00 | 3,390 |
| Exterior Doors: | | | | |
| Ext Insulated HM Doors and Frame: | | | | |
| Sgl B1 7'H | 4 | EA | 585.00 | 2,340 |
| Dbl B2 7'H | 1 | EA | 1,170.00 | 1,170 |
| Sgl B1 8'H | 1 | EA | 630.00 | 630 |
| Dbl B2 8'H | 8 | EA | 1,260.00 | 10,080 |
| Partitions: | | | | |
| Interior HM Frame Glass & Glazing: | | N/A | | |
| | | | | 136,485 |

081416 FLUSH WOOD DOORS

| | | | | |
|---|---|---|---|---|
| Interior Doors: | | | | |
| Int. Prefinished Wood Door (Glass): | | | | |
| Sgl B1 2'x 8'H | 35 | EA | 490.00 | 17,150 |
| Sgl B1 3'x 8'H | 77 | EA | 530.00 | 40,810 |
| 90 Min Sgl B1 3'x 8'H | 8 | EA | 560.00 | 4,480 |
| Dbl B2 8'H | 13 | EA | 1,060.00 | 13,780 |
| Sgl C1 7'H | 6 | EA | 610.00 | 3,660 |
| Sgl C1 8'H | 105 | EA | 635.00 | 66,675 |
| Dbl C2 8'H | 9 | EA | 1,270.00 | 11,430 |
| Dbl C3 8'H | 1 | EA | 1,240.00 | 1,240 |
| | | | | 159,225 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 083100 ACCESS DOORS AND PANELS | | | | |
| Partitions: | | | | |
| Access panels | 1 | LS | 30,000.00 | 30,000 |
| | | | | 30,000 |
| 083323 SPECIAL DOORS | | | | |
| Interior Doors: | | | | |
| Café/Learning Common: | | | | |
| Coiling Security Mesh Drape ( 21'x 8' -2EA | 336 | SF | 95.00 | 31,920 |
| Servery : | | | | |
| Coiling Security Mesh Drape ( 40'x 8' -1EA | 320 | SF | 95.00 | 30,400 |
| Main office: | | | | |
| Coiling Security Mesh Drape ( 21' x 5' 6"-1 | 116 | SF | 95.00 | 10,973 |
| Exterior Doors: | | | | |
| Motor Operated Insulated OH Door: | | | | |
| Tech-Makerspace (10'x10'6" ) | 1 | EA | 7,500.00 | 7,500 |
| | | | | 80,793 |
| 084513 STRUCT-POLYCARBONATE PNL ASSEMB. & SKYLIGHTS | | | | |
| Roof Coverings: | | | | |
| Main Entrance Canopy -Complete: | | | | |
| Clear Polycarb glazing w/ alum struct -7'w | 82 | SF | 175.00 | 14,350 |
| *Includes Section 086300 | | | | |
| | | | | 14,350 |
| 087100 DOOR HARDWARE | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Exterior Doors | | | | |
| Hardware Set @ Ext. Alum Door: | | | | |
| 1 | 1 | EA | 750.00 | 750 |
| 2 | 1 | EA | 825.00 | 825 |
| 3 | 3 | EA | 2,250.00 | 6,750 |
| 4 | 2 | EA | 2,300.00 | 4,600 |
| 5 | 1 | EA | 3,850.00 | 3,850 |
| SGL -allow | 2 | EA | 2,500.00 | 5,000 |
| 9 | 1 | EA | 1,425.00 | 1,425 |
| 11 | 1 | EA | 5,900.00 | 5,900 |
| 12 | 1 | EA | 6,300.00 | 6,300 |
| Terrace - sgl | -1 | EA | 2,000.00 | -2,000 |
| Terrace - dbl | -1 | EA | 4,000.00 | -4,000 |
| Entry - sgl | 1 | EA | 4,000.00 | 4,000 |
| Hardware Set # Ext HM Door: | | | | |
| 6 | 1 | EA | 1,150.00 | 1,150 |
| 8 | 3 | EA | 2,925.00 | 8,775 |
| 10 | 2 | EA | 4,500.00 | 9,000 |
| 13 | 1 | EA | 2,475.00 | 2,475 |
| 14 | 3 | EA | 2,325.00 | 6,975 |
| 16 | 1 | EA | 750.00 | 750 |
| 17 | 1 | EA | 3,350.00 | 3,350 |
| 18 | 1 | EA | 1,400.00 | 1,400 |
| 19 | 1 | EA | 5,100.00 | 5,100 |
| *Hardware also included with 080001 | | | | |
| Interior Doors: | | | | |
| Hardware Set @ Int. Alum Door: | | | | |
| 15 | 5 | EA | 5,425.00 | 27,125 |
| Hardware Set @ Typ Int. Doors ( per Spec ): | | | | |
| 20 | 1 | EA | 1,500.00 | 1,500 |
| 22 | 2 | EA | 785.00 | 1,570 |
| 23 | 1 | EA | 805.00 | 805 |
| 24 | 13 | EA | 695.00 | 9,035 |
| 25 | 2 | EA | 485.00 | 970 |
| 26 | 1 | EA | 460.00 | 460 |
| 27 | 2 | EA | 590.00 | 1,180 |
| 28 | 23 | EA | 670.00 | 15,410 |
| 29 | 10 | EA | 510.00 | 5,100 |
| 30 | 44 | EA | 585.00 | 25,740 |
| 31 | 1 | EA | 480.00 | 480 |
| 32 | 39 | EA | 680.00 | 26,520 |
| 33 | 1 | EA | 510.00 | 510 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 34 | 1 | EA | 510.00 | 510 |
| 35 | 1 | EA | 810.00 | 810 |
| 36 | 12 | EA | 810.00 | 9,720 |
| 37 | 1 | EA | 910.00 | 910 |
| 38 | 2 | EA | 835.00 | 1,670 |
| 39 | 1 | EA | 835.00 | 835 |
| 40 | 49 | EA | 985.00 | 48,265 |
| 41 | 18 | EA | 835.00 | 15,030 |
| 42 | 2 | EA | 1,785.00 | 3,570 |
| 43 | 5 | EA | 785.00 | 3,925 |
| 44 | 1 | EA | 805.00 | 805 |
| 45 | 1 | EA | 1,835.00 | 1,835 |
| 46 | 6 | EA | 2,005.00 | 12,030 |
| 47 | 1 | EA | 3,085.00 | 3,085 |
| 48 | 2 | EA | 1,470.00 | 2,940 |
| 49 | 1 | EA | 885.00 | 885 |
| 50 | 1 | EA | 1,045.00 | 1,045 |
| 51 | 3 | EA | 1,345.00 | 4,035 |
| 52 | 1 | EA | 1,415.00 | 1,415 |
| 53 | 5 | EA | 1,665.00 | 8,325 |
| 54 | 3 | EA | 1,485.00 | 4,455 |
| 55 | 2 | EA | 1,135.00 | 2,270 |
| 56 | 3 | EA | 2,790.00 | 8,370 |
| 57 | 2 | EA | 1,945.00 | 3,890 |
| 58 | 1 | EA | 4,270.00 | 4,270 |
| 59 | 1 | EA | 4,465.00 | 4,465 |
| 60 | 1 | EA | 4,445.00 | 4,445 |
| 61 | 2 | EA | 4,610.00 | 9,220 |
| 62 - Coiling dr | | w/Unit Cost | | |
| Toilet rm - multi user | 12 | EA | 1,200.00 | 14,400 |
| Storage rm - sgl | 1 | EA | 550.00 | 550 |
| | | | | 366,760 |

089000 LOUVERS & VENTS

| | | | | |
|---|---|---|---|---|
| Exterior Windows: | | | | |
| Vert Alum louver w/damper (RFI #17) | 660 | SF | 125.00 | 82,500 |
| Roof Openings: | | | | |
| Elevator vent | 1 | EA | 1,500.00 | 1,500 |
| | | | | 84,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 09 - FINISHES | | | | |
| 090003 TILE* | | | | |
| *Noted 5'6" on A441 | | | | |
| Wall Finishes: | | | | |
| Drinking Fountain Alcove (7 loc): | | | | |
| Ceramic wall tile 6'h | 405 | SF | 35.00 | 14,175 |
| Multi User Toilet Rm (16 EA) | | | | |
| Ceramic wall tile 6'h | 1,355 | SF | 23.00 | 31,165 |
| Sgl User Toilet Rm (15 EA): | | | | |
| Ceramic wet wall tile 6'h | 835 | SF | 23.00 | 19,205 |
| Floor Finishes: | | | | |
| Café/Learning Commons: | | | | |
| Porcelain tile | 5,583 | SF | 24.00 | 133,992 |
| Quarry Tile: | | | | |
| Kitchen / servery | 1,654 | SF | 17.25 | 28,532 |
| Wall base | 290 | LF | 9.75 | 2,828 |
| | | | | 229,896 |
| 090006 RESILIENT FLOORING* | | | | |
| Floor Finishes: | | | | |
| Moisture mitigation -spec | 46,242 | SF | 1.00 | 46,242 |
| LT-linoleum tile TYP | 59,665 | SF | 5.00 | 298,325 |
| LP - linoleum plank Corridor | 28,786 | SF | 6.50 | 187,109 |
| LP - linoleum plank breakout area | | w/ corr. | | |
| Acoustical Mat - nr 99 (2nd & 3rd flr) | 36,500 | SF | 3.50 | 127,750 |
| *Includes sections 0965000 & 096513 | | | | |
| Wall Finishes: | | | | |
| Wall base 12" VCT tile w/ Schluter top edg | 28,500 | LF | 6.50 | 185,250 |
| Wall base 6" @ locker box | 1,050 | LF | 5.00 | 5,250 |
| Typ resilient wall base - allow | 1 | LS | 7,500.00 | 7,500 |
| Stair Finishes: | | | | |
| Metal Pan Stair Learning Commons Stair ( 4 FLT): | | | | |
| VCT tile landing | 172 | SF | 8.00 | 1,376 |
| VCT treads & risers w/rub nosing | 678 | LFR | 14.25 | 9,662 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Aud Stair Finish | | W/ C1030 | | |
| | | | | 868,464 |
| 090009 PAINTING* | | | | |
| Exterior Walls: | | | | |
| Misc exterior painting -allow | 1 | LS | 10,000.00 | 10,000 |
| Exterior Doors: | | | | |
| Paint HM door & Frame - sgl | 5 | EA | 120.00 | 600 |
| Paint HM door & Frame - dbl | 9 | EA | 225.00 | 2,025 |
| Interior Doors: | | | | |
| Paint Int HM door frame: | | | | |
| Single Door 7'H | 22 | EA | 125.00 | 2,750 |
| Double Door 7'H | 1 | EA | 145.00 | 145 |
| Single Door 8' H | 251 | EA | 140.00 | 35,140 |
| Double door 8'H | 26 | EA | 160.00 | 4,160 |
| Paint Int HM door: | | | | |
| Sgl B1 7'H | 15 | EA | 150.00 | 2,250 |
| 90 Min Sgl B1 7'H | 1 | EA | 150.00 | 150 |
| Dbl B2 7'H | 1 | EA | 300.00 | 300 |
| Sgl B1 8'H | 25 | EA | 175.00 | 4,375 |
| 90 Min Sgl B1 8'H | 1 | EA | 175.00 | 175 |
| 90 Min Dbl B2 8'H | 3 | EA | 300.00 | 900 |
| Stair Finishes: | | | | |
| Paint Metal Pan Stair & Rail: | | | | |
| 5' W @ Learning Commons 1st- 3rd | 2 | FLTS | 2,500.00 | 5,000 |
| 8' W @ Learning Commons 1st- 2nd | 2 | FLTS | 2,750.00 | 5,500 |
| 5' W @ Stair Hall | 5 | FLTS | 2,500.00 | 12,500 |
| Seal Concrete Finish: | | | | |
| 5' W @ Stair Hall | 5 | FLTS | 2,000.00 | 10,000 |
| Wall Finishes: | | | | |
| Interior painting- walls | 136,600 | GSF | 1.90 | 259,540 |
| Floor Finishes: | | | | |
| SC Sealed Concrete Floor Finish (030513): | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Storage, mech, elec & receiving | 5,561 | SF | 2.00 | 11,122 |
| Ceiling Finishes: | | | | |
| Paint gyp ceiling | 45,000 | SF | 1.00 | 45,000 |
| Paint gyp soffits | 1 | LS | 25,000.00 | 25,000 |
| Paint exposed structure- 100%: | | | | |
| Class Small Closet( 34 loc) | 408 | SF | 2.00 | 816 |
| Typ mech, elec & storage rm | 5,759 | SF | 2.00 | 11,518 |
| Auditorium & stage | 5,996 | SF | 2.50 | 14,990 |
| Main gym deck | 8,268 | SF | 4.00 | 33,072 |
| Typ, Sci, Art, Music, & Media - exp deck | 23,986 | SF | 2.00 | 47,972 |
| Stair hall | 1,203 | SF | 2.00 | 2,406 |
| | | | | 547,406 |
| 092116 GYPSUM WALLBOARD ASSEMBLIES | | | | |
| Partitions: | | | | |
| Firestopping | 136,600 | GSF | 0.65 | 88,790 |
| 6/A323 Exterior Wall - Raised Commons: | | | | |
| 4" Mineral fiber insul | 2,486 | SF | 2.65 | 6,588 |
| Exterior Ceiling Insulation @ : | | | | |
| Bay / covered entry | 1,119 | SF | 5.00 | 5,595 |
| Exterior Ceiling Stucco System: | | | | |
| Bay/covered entry | 1,119 | SF | 32.00 | 35,808 |
| Spray foam at perm openings | 9,299 | LF | 8.25 | 76,717 |
| Exterior Windows: | | | | |
| P.T. - perm blocking | 9,009 | LF | 8.65 | 77,928 |
| Exterior Doors: | | | | |
| P.T. - perm blocking HM open | 316 | LF | 8.00 | 2,528 |
| Partitions: | | | | |
| Interior blocking | 136,600 | GSF | 0.50 | 68,300 |
| Misc. rough carpentry | 136,600 | GSF | 1.15 | 157,090 |
| (5/A601) Frame AV monitor box | 65 | EA | 250.00 | 16,250 |
| Flat Roof Blocking @: | | | | |
| Base flashing | 1,620 | LF | 12.50 | 20,250 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Typ roof fascia | 3,182 | LF | 12.50 | 39,775 |
| Expansion joint | 86 | LF | 40.00 | 3,440 |
| Gable skylight curb ( 4 EA) | 567 | LF | 45.00 | 25,515 |
| Flash Pre Fab Roof Top Mech curb block | 618 | LF | 35.00 | 21,630 |
| Misc Equip blocking | 1 | LS | 7,500.00 | 7,500 |
| Roof hatch | 1 | EA | 750.00 | 750 |
| Atrium vent | 4 | EA | 750.00 | 3,000 |
| Exterior Walls: | | | | |
| 1 lyr 5/8" gyp @ stud | 43,553 | SF | 3.25 | 141,547 |
| Exterior Walls: | | | | |
| Exterior wall Backup: | | | | |
| 10" x 16 Ga. stud @ Typ 14' | 41,075 | SF | 11.70 | 480,578 |
| 10" x 16 Ga. stud @ raised common 5-6'h | 2,486 | SF | 11.70 | 29,086 |
| Entry pier/chimney framing-14'H | 668 | SF | 9.85 | 6,580 |
| 1/2" Dens glass sheathing | 44,229 | SF | 3.30 | 145,956 |
| * Mech Penthouse Unit - Complete | | W / HVAC | | |
| Ext Ceiling Framing @ : | | | | |
| Canopy & covered entry | 1,056 | SF | 6.50 | 6,864 |
| 1/2" Dens glass sheathing | 1,056 | SF | 3.50 | 3,696 |
| Partitions: | | | | |
| H6 Elevator shaft - 56'6"H | 2,095 | SF | 18.00 | 37,710 |
| C4 Auditorium -28'H | 952 | SF | 18.00 | 17,136 |
| C7 Auditorium - 28'H | 4,755 | SF | 18.00 | 85,590 |
| Stage front | 120 | SF | 9.00 | 1,080 |
| F1 gym storage -28'H | 695 | SF | 18.00 | 12,510 |
| F1 gym storage chase 1 side -28'H | 105 | SF | 16.00 | 1,680 |
| 1 side class radial mech chase 14'H | 7,318 | SF | 12.00 | 87,816 |
| Chase @ fnd wall14'H | 996 | SF | 10.00 | 9,960 |
| Drinking fountain chase wing wall14'H | 689 | SF | 10.00 | 6,890 |
| D6 & D6 Bulkhead @ dbl op part - 6'H | 114 | SF | 15.00 | 1,710 |
| Curb 1'H @ glazed part | 866 | SF | 15.00 | 12,990 |
| Bulkhead 6'H @ glazed part | 5,196 | SF | 12.00 | 62,352 |
| F6 Bulkhead @ op part - 6'H | 1,248 | SF | 12.00 | 14,976 |
| B1 Atrium shaft 2nd - high roof | 4,107 | SF | 16.50 | 67,766 |
| TYP -14' Drywall Partitions: | | | | |
| B1 | 1,621 | SF | 9.15 | 14,832 |
| B3 | 417 | SF | 10.15 | 4,233 |
| B4 | 4,116 | SF | 12.15 | 50,009 |
| C2 | 5,578 | SF | 14.65 | 81,718 |
| C3 | 9,149 | SF | 14.65 | 134,033 |
| C4 | 2,589 | SF | 14.65 | 37,929 |
| C6 | 3,620 | SF | 16.90 | 61,178 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| C7 | 1,112 | SF | 14.65 | 16,291 |
| C8 | 181 | SF | 19.40 | 3,511 |
| C10 | 229 | SF | 16.90 | 3,870 |
| D3 | 1,429 | SF | 12.65 | 18,077 |
| D6 | 455 | SF | 14.90 | 6,780 |
| E3 | 10,614 | SF | 17.15 | 182,030 |
| E4 | 580 | SF | 17.15 | 9,947 |
| E6 | 1,181 | SF | 19.40 | 22,911 |
| E7 | 894 | SF | 24.15 | 21,590 |
| E8 | 18,658 | SF | 21.90 | 408,610 |
| E9 | 2,588 | SF | 21.90 | 56,677 |
| F1 | 4,933 | SF | 19.65 | 96,933 |
| F2 | 2,142 | SF | 21.90 | 46,910 |
| F6 | 4,592 | SF | 19.65 | 90,233 |
| F8 | 775 | SF | 24.40 | 18,910 |
| H4 | 1,232 | SF | 14.65 | 18,049 |
| J1 | 7,734 | SF | 19.30 | 149,266 |
| J2 | 596 | SF | 16.40 | 9,774 |
| K1 | 7,317 | SF | 23.80 | 174,145 |
| K2 | 1,724 | SF | 23.80 | 41,031 |
| Tile Backer Bd Premium | 2,595 | SF | 1.85 | 4,801 |
| GWB @ Corridor Locker Enclosure (nic mtl locker) & Rails - allow: | | | | |
| Freestanding locker box - 1st flr | 307 | LF | 60.00 | 18,420 |
| Freestanding - locker box upper flr w/ soff | 724 | LF | 120.00 | 86,880 |
| Upper flr guardrail w/ soffit (6/A650) | 327 | LF | 55.00 | 17,985 |
| Cohort # 2059 2nd flr guard rail w/soffit(6/ | 19 | LF | 55.00 | 1,045 |
| Additional framing @ sloped AWP (A601) | 10,700 | SF | 7.50 | 80,250 |
| (5/A601) frame AV monitor box | 65 | EA | 100.00 | 6,500 |
| Tile Backer Bd Premium | | W / TILE FSB | | |
| Impact resis. Gwb premium | 1 | LS | 50,000.00 | 50,000 |
| Misc. GWB assemblies (inc extruded alum | 136,600 | GSF | 0.50 | 68,300 |
| Load, Distribute and Misc. | 136,600 | GSF | 0.50 | 68,300 |
| *Partitions include sound attenuation, tape & joint compound finish | | | | |
| Ceiling Finishes: | | | | |
| Acoustical Gypsum Plaster (092313): | | | | |
| Clg spray sys - allow | 1 | LS | TBD | |
| Typ, Sci, Art, Music, SPED & ELL Classroom CLG & Soffits: | | | | |
| Summer Beam bottom 3'W (1/A690) | 3,530 | SF | 20.00 | 70,600 |
| Summer Beam light cove & vert framing (1 | 2,354 | LF | 150.00 | 353,100 |
| Typ. gyp clg bay | 1,161 | SF | 15.00 | 17,415 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Complete soffit @ gyp bay | 326 | LF | 48.00 | 15,648 |
| Complete beam box 11'6" bot | 998 | LF | 80.00 | 79,840 |
| Sloped ACT clg - metal deck transition sol | 1,365 | LF | 32.00 | 43,680 |
| Complete soffit @ OP partition class (6/A601) | | N/A | | |
| Central Corridor CLG & Soffits: | | | | |
| Horiz gyp clg 8'AFF | 6,049 | SF | 14.00 | 84,686 |
| Horiz gyp clg 12'AFF | 2,735 | SF | 14.00 | 38,290 |
| (9/A690) Soffit @ bot of sloped ACT | 1,852 | LF | 35.00 | 64,820 |
| (8/A690) Soffit @ top of sloped ACT | 1,852 | LF | 45.00 | 83,340 |
| (7/A650) Cap @ locker box | 565 | LF | 50.00 | 28,250 |
| (6/A650) Soffit @ guardrail | 367 | LF | 50.00 | 18,350 |
| Misc. Soffits @: | | | | |
| Toilet rm light cove (7/A690) | 570 | LF | 65.00 | 37,050 |
| ACT - GWB transition 8" AFF | 75 | LF | 32.00 | 2,400 |
| Pyramid Skylight 2'H | 1,134 | SF | 45.00 | 51,030 |
| Gyp Ceiling System : | | | | |
| Atrium 3rd flr sloped gyp clg | 4,700 | SF | 30.00 | 141,000 |
| Typ gyp ceiling | 1,917 | SF | 15.00 | 28,755 |
| Emergency shw gyp clg | 54 | SF | 15.00 | 810 |
| 1 Hr gyp mech/elec | 474 | SF | 15.00 | 7,110 |
| 2Hr gyp mech/elec | 169 | SF | 22.00 | 3,718 |
| A651 Underside monumental Stair w/ retur | 800 | SF | 21.00 | 16,800 |
| Underside proj rm/bridge | 600 | SF | 21.00 | 12,600 |
| Sub acoustical clg (2/A690) | 5,296 | SF | 24.00 | 127,104 |
| Breakout rm sloped gyp clg 50% | 2,000 | SF | 16.00 | 32,000 |
| Toilet/shw rm (3 loc) | 438 | SF | 12.00 | 5,256 |
| Partitions: | | | | |
| **Breakout 3,400 GSF** | | | | |
| Breakout Floor Framing -Allow: | | | | |
| Light gauge floor | 1,600 | SF | 20.00 | 32,000 |
| 9/16" Metal Deck | 1,600 | SF | 4.00 | 6,400 |
| Concrete Deck fill | | w/ package #2 | | |
| Breakout A( 2 story): | | | | |
| P lam wall finish -allow | 0 | SF | 55.00 | 0 |
| Typ GWB wall -sgl stud | 1,605 | SF | 25.00 | 40,125 |
| GWB chase wall-complete | 978 | SF | 25.00 | 24,450 |
| GWB roof | 260 | SF | 25.00 | 6,500 |
| Breakout B( 3 story): | | | | |
| P lam wall finish -allow | 0 | SF | 55.00 | 0 |
| GWB chase wall-complete | 1,566 | SF | 25.00 | 39,150 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| GWB roof | 300 | SF | 25.00 | 7,500 |
| Breakout C( 2 story w/ guard rail 3rd flr): | | | | |
| P lam wall finish -allow | 0 | SF | 55.00 | 0 |
| Typ GWB wall -sgl stud | 1,488 | SF | 25.00 | 37,200 |
| GWB chase wall-complete | 1,038 | SF | 25.00 | 25,950 |
| Typ GWB knee wall -sgl stud | 42 | SF | 25.00 | 1,050 |
| GWB chase knee wall-complete | 107 | SF | 25.00 | 2,675 |
| Cap @ knee wall walls | 44 | LF | 25.00 | 1,100 |
| Breakout D( 1 story): | | | | |
| P lam wall finish -allow | 0 | SF | 55.00 | 0 |
| Typ GWB wall -sgl stud | 617 | SF | 25.00 | 15,425 |
| GWB roof | 205 | SF | 25.00 | 5,125 |
| Breakout E ( 1 story): | | | | |
| P lam wall finish -allow | 0 | SF | 55.00 | 0 |
| Typ GWB wall -sgl stud | 249 | SF | 25.00 | 6,225 |
| GWB chase wall-complete | 286 | SF | 25.00 | 7,150 |
| GWB roof | 292 | SF | 25.00 | 7,300 |
| Wall Finish: | | | | |
| 8' FRP Wall Panel -allow: | | | | |
| Main kitchen | 2,233 | SF | 9.75 | 21,772 |
| | | | | 5,724,632 |
| 095100 ACOUSTICAL CEILINGS* | | | | |
| A1 2'x2'and 4' x 3/4"ACT Ceiling System @ : | | | | |
| A1 Typ ACT | 2,525 | SF | 9.00 | 22,725 |
| A1 Splayed ACT (20%) | 1,870 | SF | 8.25 | 15,428 |
| A2 2'x2'and 4' x 5/8"ACT Ceiling System @ : | | | | |
| A2 Typ ACT | 6,546 | SF | 8.25 | 54,005 |
| A2 Splayed ACT (20%) | 20,732 | SF | 8.25 | 171,039 |
| A2 Breakout rooms (50%) | 1,715 | SF | 10.00 | 17,150 |
| A 2 ACT 2 x 2 ( previously act -3 ) | 1,400 | SF | 8.25 | 11,550 |
| A 4 Kitchen / servery | 1,688 | SF | 6.75 | 11,394 |
| Random Size Ultima: | | | | |
| Corridor 8'w | 13,564 | SF | 10.00 | 135,640 |
| Exterior Soffit panel | | W /Ext Wall | | |

*Includes Sections 095100 & 095133

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Wall Finish: | | | | |
| Fabric Wrapped Acoustical Panels 1": | | | | |
| Media ctr | 1,260 | SF | 32.00 | 40,320 |
| Science Lab Classroom (260 SF /6 EA) | 1,560 | SF | 32.00 | 49,920 |
| Makerspace ( 1 EA) | 224 | SF | 32.00 | 7,168 |
| Fab-lab ( 1 EA) | 250 | SF | 32.00 | 8,000 |
| Art Class Room ( 1 EA) | 300 | SF | 32.00 | 9,600 |
| Teacher Prep Room ( 24 EA) | | N/A | | |
| Typ, SPED & ELL Classroom 206SF / 32 | 6,592 | SF | 32.00 | 210,944 |
| Drama Classroom ( 1 EA) | 300 | SF | 32.00 | 9,600 |
| Band Rm ( 1 EA) | 912 | SF | 32.00 | 29,184 |
| Chorus Classroom ( 1 EA) | 309 | SF | 32.00 | 9,888 |
| Guidance Suite (133 SF /3 Loc) | 399 | SF | 32.00 | 12,768 |
| Break out areas | | NIC | | |
| Auditorium | | NIC | | |
| Wall Finish: | | | | |
| Cementitious Wood Fiber Wall Panel: | | | | |
| Music practice rm ( 3 EA) | 409 | SF | 19.00 | 7,771 |
| Band Rm ( 1 EA) | 833 | SF | 19.00 | 15,827 |
| Gymnasium | 4,344 | SF | 19.00 | 82,536 |
| | | | | --- |
| | | | | 932,456 |
| 096446 WOOD & ATHLETIC FLOORING | | | | |
| Floor Finishes: | | | | |
| Main Gym: | | | | |
| Moisture mitigation -(vapor retarder) | 8,276 | SF | 4.75 | 39,311 |
| Wood Maple Gym flooring | 8,276 | SF | 19.00 | 157,244 |
| Vented wall base | 365 | LF | 9.85 | 3,595 |
| Auditorium (8/A602) - Finish Carp Spec: | | | | |
| Stage flooring - 4" assembly | 1,540 | SF | 14.00 | 21,560 |
| Stage nosing | 59 | LF | 38.00 | 2,242 |
| Stage wall base /transition | 113 | LF | 9.85 | 1,113 |
| *Includes Sections 096429 & 096466 | | | | |
| | | | | --- |
| | | | | 225,065 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 096712 RESINOUS FLOORING | | | | |
| Floor Finishes: | | | | |
| SGL User Toilet Room (15 EA) : | | | | |
| Epoxy flr w/int base | 997 | SF | 18.00 | 17,946 |
| Shw receptor 3x3 | 1 | EA | 550.00 | 550 |
| Shw receptor 5x3 | 2 | EA | 700.00 | 1,400 |
| Threshold/transition | 15 | EA | 200.00 | 3,000 |
| Multi User Toilet & Locker Room( 18 EA): | | | | |
| Epoxy flr w/int base | 4,601 | SF | 18.00 | 82,818 |
| Threshold/transition | 18 | EA | 200.00 | 3,600 |
| | | | | 109,314 |
| 096800 CARPET | | | | |
| Floor prep | 1,033 | SF | 0.25 | 258 |
| Floor Finishes: | | | | |
| Auditorium: | | | | |
| Carpet aisle | 1,033 | SF | 6.00 | 6,198 |
| Carpet aisle stair/stage (4 riser) | 4 | FLT | 500.00 | 2,000 |
| | | | | 8,456 |
| 097217 DIGITAL IMAGE WALL COVERINGS | | | | |
| Wall Finish: | | | | |
| Mural - Digital image wall covering - install only w/ 1 /2" GWB Back up: | | | | |
| Media center | | BY OTHERS | | |
| | | | | 0 |
| 097233 DRY-ERASE WALL COVERING | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | --- |
| | | | | 0 |
| 097733 SANITARY WALL PANELS | | | | |
| | | | | --- |
| | | | | 0 |
| 098100 ACOUSTICAL INSULATION | w/092116 | | | |
| | | | | --- |
| | | | | 0 |
| 098400 ACOUSTIC ROOM COMPONENTS | | | | |
| | | | | --- |
| | | | | 0 |
| 098415 WOOD FIBER ACOUSTICAL PANELS | | | | |
| | | | | --- |
| | | | | 0 |
| DIVISION 10 - SPECIALTIES | | | | |
| 101100 MARKERBOARDS & TACKBOARDS | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Fittings: | | | | |
| Allow: | | | | |
| Media center tack surfaces | 100 | SF | 28.00 | 2,800 |
| 4'H Tack Board | 30 | EA | 400.00 | 12,000 |
| *Dry-erase magnetic wall covering is included in C3010 | | | | |
| Wall Finish: | | | | |
| Dry Erase Wall Finish | 6,640 | SF | 25.00 | 166,000 |
| | | | | --- |
| | | | | 180,800 |
| 101400 SIGNAGE | | | | |
| Exterior Walls: | | | | |
| Ext. Signage: | | | | |
| 18" Cast bronze letter (1 loc) - chimney | 6 | EA | 650.00 | 3,900 |
| Cast lettering @ entry ramp | 18 | EA | 500.00 | 9,000 |
| Fittings | | | | |
| Allow: | | | | |
| Building directory | 1 | EA | 5,000.00 | 5,000 |
| Dedication plaque | 1 | EA | 3,800.00 | 3,800 |
| Room ID sign | 136,600 | GSF | 0.22 | 30,052 |
| Misc Int. ADA signage | 136,600 | GSF | 0.12 | 16,392 |
| | | | | --- |
| | | | | 68,144 |
| 102113 TOILET COMPARTMENTS | | | | |
| Fittings: | | | | |
| HDPE Toilet Partitions: | | | | |
| Std. partition | 23 | EA | 1,220.00 | 28,060 |
| HC partition | 16 | EA | 1,430.00 | 22,880 |
| Urinal screen | 15 | EA | 310.00 | 4,650 |
| | | | | --- |
| | | | | 55,590 |
| 102600 WALL AND DOOR PROTECTION | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Fittings: | | | | |
| Vinyl/Acrylic Composite: | | | | |
| Corner guard | 1 | LS | 5,000.00 | 5,000 |
| Crash rail | 1 | LS | 5,000.00 | 5,000 |
| | | | | 10,000 |

102813 TOILET ACCESSORIES

| | | | | |
|---|---|---|---|---|
| Fittings: | | | | |
| SGL User Toilet Rm Accessories ( 15 ea): | | | | |
| Tilt mirror @ wall hung lav | 15 | EA | 220.00 | 3,300 |
| Soap dispenser (owner furnish & installed) | | NIC | | |
| Toilet tissue dispenser | 15 | EA | 48.00 | 720 |
| San. prod. disposal | 15 | EA | 60.00 | 900 |
| Toilet grab bars | 30 | EA | 85.00 | 2,550 |
| Paper towel dispenser-allow | 15 | EA | 135.00 | 2,025 |
| Waste receptacle | 15 | EA | 150.00 | 2,250 |
| Elec hand dryer - allow | | NIC | | |
| Coat hook | 15 | EA | 25.00 | 375 |
| Fixed diaper changing sta - allow | 3 | EA | 550.00 | 1,650 |
| 3' ADA SHW accessories -allow | 1 | EA | 550.00 | 550 |
| Multi User Toilet & Locker Rm Accessories (16 ea): | | | | |
| Soap dispenser (owner furnish & installed) | | NIC | | |
| Toilet tissue dispenser | 39 | EA | 48.00 | 1,872 |
| San. prod. disposal | 27 | EA | 60.00 | 1,620 |
| Toilet grab bars | 32 | EA | 85.00 | 2,720 |
| Paper towel dispenser- 2/rm | 32 | EA | 135.00 | 4,320 |
| Waste receptacle - 2/rm | 32 | EA | 150.00 | 4,800 |
| Elec hand dryer - allow | | NIC | | |
| Coat hook | 39 | EA | 25.00 | 975 |
| 5' ADA shw accessories - allow | 2 | EA | 550.00 | 1,100 |
| Dressing Rm Accessories (2 ea): | | | | |
| Soap dispenser (owner furnish & installed) | | NIC | | |
| Allow: | | | | |
| Misc. locker rm accessories | 2 | EA | 1,000.00 | 2,000 |
| Janitor shelf/mop holder | 7 | EA | 200.00 | 1,400 |
| *Excludes classroom and workroom accessories | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | 35,127 |
| 104000 SAFETY SPECIALTIES | | | | |
| Fittings: | | | | |
| Safety Specialties : | | | | |
| Hose connection cabinet | 16 | EA | 350.00 | 5,600 |
| First aid kit (nic sci rm) | 6 | EA | 450.00 | 2,700 |
| Fire Dept key cab | 2 | EA | 1,000.00 | 2,000 |
| Fire extinguisher and cab (nic sci rm) | 20 | EA | 475.00 | 9,500 |
| AED & cabinets | 4 | EA | 750.00 | 3,000 |
| *See also science equipment | | | | |
| | | | | 22,800 |
| 107113 EXTERIOR SUN CONTOL DEVICES | | | | |
| | | N/A | | |
| | | | | 0 |
| 109000 MISCELLANEOUS SPECIALTIES | | | | |
| Exterior Walls: | | | | |
| LVL 2 entry flagpole 34' H | 1 | EA | 9,000.00 | 9,000 |
| Fittings: | | | | |
| Phenolic Locker-Allow: | | | | |
| 15" wx12"dx36"H corridor (nic enclosure) | 660 | EA | 580.00 | 382,800 |
| Metal Locker: | | | | |
| 15"w x 15"d x 30"H PE student 2 tiered | 40 | EA | 215.00 | 8,600 |
| 15"w x 15"d - Custodian/kitchen staff db | 6 | EA | 265.00 | 1,590 |
| 12" Kitchen staff dbl tier | 3 | EA | 265.00 | 795 |
| Locker base @ : | | | | |
| Student corridor | | W /Enclosure | | |
| PE student | 50 | LF | 36.00 | 1,800 |
| PE staff | 9 | LF | 36.00 | 324 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Free Standing Wood Bench: | | | | |
| PE locker rm (2 EA) | 12 | LF | 125.00 | 1,500 |
| Health office cubicle track w/ curtain | 3 | EA | 1,325.00 | 3,975 |
| Secure wall panels-Allow: | | | | |
| OT/PT rm (1 ea) | 320 | SF | 15.00 | 4,800 |
| Padded athletic flr tiles - allow: | | | | |
| OT/PT rm (1 ea) | 100 | SF | 15.00 | 1,500 |
| Partitions: | | | | |
| Folding Panel partition: | | | | |
| 16' x 8' H Typ classroom (13 EA) | 1,664 | SF | 106.00 | 176,384 |
| (22/A620)Dbl 19' x 8'H Music rm acoustic | 152 | SF | 106.00 | 16,112 |
| 8' H SPED suite (3 LOC) | 960 | SF | 106.00 | 101,760 |
| *Includes pass dr & white bd finish | | | | |
| *Includes Sections 102123, 102239, 105113, 105123 & 107113 | | | | |
| | | | | 710,940 |
| DIVISION 11 - EQUIPMENT | | | | |
| 113100 RESIDENTIAL APPLIANCES | | | | |
| Custodian Storage Rm #1216: | | | | |
| Stack washer/dryer | 1 | EA | 2,500.00 | 2,500 |
| Custodian Office/Break Rm (1 EA): | | | | |
| Refrigerator -full size | 1 | EA | 1,400.00 | 1,400 |
| Staff Dinning Rm ( 1 ea): | | | | |
| Refrigerator -full size | 1 | EA | 1,400.00 | 1,400 |
| Medical Suite: | | | | |
| Refrigerator -full size | 1 | EA | 1,400.00 | 1,400 |
| SPED Classroom 1260 (12/A410): | | | | |
| Range | 1 | EA | 750.00 | 750 |
| Refrigerator | 1 | EA | 1,400.00 | 1,400 |
| Washer | 1 | EA | 1,500.00 | 1,500 |
| Range hood | | NIC | | |
| Dryer | | NIC | | |
| Dishwasher | | NIC | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Kitchen washer and dryer | W / Kitchen Equipment | | | |
| Science rm appliance | W / Science Equipment | | | |
| | | | | 10,350 |
| 114000 FOOD SERVICE EQUIPMENT | | | | |
| Kitchen equipment & casework | 1 | LS | 415,270.00 | 415,270 |
| *Kitchen equipment & casework Quote 7/19/2019 | | | | |
| | | | | 415,270 |
| 115213 PROJECTION SCREENS | | | | |
| Projection Screen - Elec Op. - Allow: | | | | |
| 18' auditorium (spec) | 1 | EA | 15,000.00 | 15,000 |
| 18' Café/Learning commons (clg plan) | 1 | EA | 15,000.00 | 15,000 |
| 18' Gym - allow | 1 | EA | 15,000.00 | 15,000 |
| Media center (spec) | 2 | EA | 10,000.00 | 20,000 |
| | | | | 65,000 |
| 116143 THEATRICAL EQUIPMENT(No Spec) | | | | |
| Auditorium (6/28/2019 Quote 420 Seat)- Allow: | | | | |
| Theatrical Rigging | 1 | LS | 158,300.00 | 158,300 |
| Theatrical Draperies | 1 | LS | 33,854.00 | 33,854 |
| Theatrical Lighting Instruments & Access. | 1 | LS | 129,018.00 | 129,018 |
| Theatrical Lighting Control System | 1 | LS | 95,749.00 | 95,749 |
| Technology and Local Sound: | | | | |
| Gym | 1 | EA | 120,000.00 | 120,000 |
| Café | 1 | LS | 50,000.00 | 50,000 |
| Aud Audio Visual System | 1 | LS | 200,000.00 | 200,000 |
| Band and Chorus Class | 1 | LS | 60,000.00 | 60,000 |
| Drama Class | 1 | LS | 20,000.00 | 20,000 |
| | | | | 866,921 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 116600 ATHLETIC & SPORTS EQUIPMENT | | | | |
| Main Gym: | | | | |
| Basketball backstops - electric | 6 | EA | 9,500.00 | 57,000 |
| Wall padding | 861 | SF | 17.00 | 14,637 |
| Motor op divider curtain (51'x24')-allow | 1,224 | SF | 16.00 | 19,584 |
| Volley ball court equip. | 2 | PR | 700.00 | 1,400 |
| Scoreboard (2 EA Spec 116643) | W / Electrical | | | |
| Batting cage (not shown) | 1 | EA | 10,000.00 | 10,000 |
| *Includes Sections 116623 - 116653 | | | | |
| | | | | 102,621 |
| 119000 MISC. EQUIPMENT | | | | |
| Allow: | | | | |
| Loading dock bumpers | 1 | LS | 3,500.00 | 3,500 |
| Kiln (11.38) | 1 | EA | 4,000.00 | 4,000 |
| Metal storage shelving | | NIC | | |
| Library equipment | | NIC | | |
| Power op changing table- Hoyer lift | | NIC | | |
| Vocational shop equipment(spec 115700) | 1 | LS | 25,000.00 | 25,000 |
| A420 Exhaust hood Tech Lab | W/Vocational allowance | | | |
| *Includes Section 115300, 115313 & 115700 | | | | |
| | | | | 32,500 |
| DIVISION 12 - FURNISHINGS | | | | |
| 122400 WINDOW SHADES | | | | |
| Exterior Manual op Window Shade | 10,000 | SF | 8.00 | 80,000 |
| Motor Op shade | 970 | SF | 28.00 | 27,160 |
| Interior Roller Shade (4/A690): | | | | |
| Int borrowed light | 3,304 | SF | 6.50 | 21,476 |
| Door Manual Shade | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Single Door | 50 | EA | 150.00 | 7,500 |
| | | | | 136,136 |
| 122414 MOTORIZED WINDOW SHADES | | | | |
| Motorized skylight shade (122414) | | NIC | | |
| | | | | 0 |
| 123553 CASEWORK | | | | |
| Allow -Science Lab Classroom Equipment ( 6 EA): | | | | |
| Safety glasses monitor case | 6 | EA | 1,000.00 | 6,000 |
| Glassware pegboards ( 1/RM) - allow | 6 | EA | 350.00 | 2,100 |
| Sgl sided fume hood #2210 | 1 | EA | 7,200.00 | 7,200 |
| Dbl sided fume hood #2214 | 1 | EA | 9,500.00 | 9,500 |
| First aid kit - allow | 6 | EA | 300.00 | 1,800 |
| OH track - equip support - allow | | NIC | | |
| Safety SHW | | w/ plumbing | | |
| Fire blanket | 6 | EA | 500.00 | 3,000 |
| Fire ext & cab ( 1/RM) | 6 | EA | 425.00 | 2,550 |
| Misc equipment | 6 | RM | 500.00 | 3,000 |
| Science Shared Prep Room Equipment ( 3 EA): | | | | |
| Refrigerator - full size | 3 | EA | 750.00 | 2,250 |
| Dishwasher under counter | 3 | EA | 1,100.00 | 3,300 |
| Glassware pegboards (1 RM) - allow | 1 | EA | 350.00 | 350 |
| Misc equipment | 3 | RM | 500.00 | 1,500 |
| Chem storage/fume unit | 2 | EA | 8,500.00 | 17,000 |
| *Includes Sections 115300 - 115313 | | | | |
| Science Lab Classroom ( 6 EA): | | | | |
| Sink | | | w/ plumbing | |
| 24" Epoxy ctr (no base cab (48.5LF/RM) | 291 | LF | 295.00 | 85,845 |
| 24"H Epoxy backsplash ( 48.5 LF/RM) | 582 | SF | 95.00 | 55,290 |
| Mobile storage cab (36"wx27"h 8/RM) | 48 | EA | 1,200.00 | 57,600 |
| P lam Wall cab (10 LF/RM) | 60 | LF | 210.00 | 12,600 |
| Teachers demo table | | NIC | | |
| Student table | | NIC | | |
| Science Shared Prep Room ( 3 EA): | | | | |
| Sink | | | w/ plumbing | |
| 24" Epoxy ctr (no base cab ) | 54 | LF | 295.00 | 15,930 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 24"H Epoxy backsplash | 109 | SF | 95.00 | 10,355 |
| P lam Wall cab | 30 | LF | 210.00 | 6,300 |
| Mobile storage cab (36"wx27"h) | 8 | EA | 1,200.00 | 9,600 |
| Art Class Room (1 EA): | | | | |
| Epoxy ctr (no base cab) | 20.5 | LF | 295.00 | 6,048 |
| 24"H Epoxy backsplash | 41 | SF | 95.00 | 3,895 |
| | | | | 323,013 |
| 124813 FLOOR MATS | | | | |
| Floor Finishes: | | | | |
| Recessed mtl vest. grille (2 loc) | 360 | SF | 22.00 | 7,920 |
| | | | | 7,920 |
| 124816 ENTRANCE GRILLES & FRAMES | | w/124813 | | |
| | | | | 0 |
| 126613 TELESCOPING BLEACHERS | | | | |
| Wall Mtd Motor op Bleacher (qty noted) | 650 | SEAT | 125.00 | 81,250 |
| | | | | 81,250 |
| 129000 MISCELLANEOUS FURNISHING | | | | |
| Auditorium fixed seat | 321 | EA | 295.00 | 94,695 |
| Removable auditorium seat | 46 | EA | 125.00 | 5,750 |
| Stackable auditorium seat | 48 | EA | 125.00 | 6,000 |
| *Includes Section 126100 | | | | |
| Choral classroom risers | | W/FFE | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Band classroom risers | | W/FFE | | |
| Stage risers | | W/FFE | | |
| *Includes Section 126100 | | | | |
| | | | | 106,445 |
| DIVISION 13 - SPECIAL CONSTRUCTION | | | | |
| 130000 SPECIAL CONSTRUCTION | | N/A | | |
| | | | | 0 |
| DIVISION 14 - CONVEYING EQUIPMENT | | | | |
| 140001 ELEVATORS* | | | | |
| Passenger elevator ( 1 door - 4,500 lb) | 4 | STOP | 53,000.00 | 212,000 |
| *Includes roof level stop | | | | |
| | | | | 212,000 |
| DIVISION 21 - FIRE SUPPRESSION | | | | |
| 210001 FIRE SUPPRESSION* | | | | |
| 6" BF Preventer | 1 | EA | 7,450.00 | 7,450 |
| Wet valve assembly | 1 | LS | 3,500.00 | 3,500 |
| Elec. bell | 1 | LS | 1,500.00 | 1,500 |
| Siamese fire dept connection | 1 | LS | 1,350.00 | 1,350 |
| Fire Dept. Connection: | | | | |
| 2 1/2" w/cabinet | 9 | EA | 1,850.00 | 16,650 |
| Siamese FD Connection | 2 | EA | 1,235.00 | 2,470 |
| FCVA - 4" | 9 | EA | 1,050.00 | 9,450 |
| Tamper sw | 30 | EA | 225.00 | 6,750 |
| Heads and Branch: | | | | |
| Semi Recess head - typ. | 946 | EA | 295.00 | 279,070 |
| Concealed head - aud. | 41 | EA | 750.00 | 30,750 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Upright head | 315 | EA | 329.00 | 103,635 |
| Upright w/ cage | 71 | EA | 360.00 | 25,560 |
| Sidewall | 144 | EA | 285.00 | 41,040 |
| Window wash | 12 | EA | 385.00 | 4,620 |
| Additional head | 200 | EA | 295.00 | 59,000 |
| 3" drain | 220 | LF | 31.50 | 6,930 |
| 2 1/2" - 6" | 5,100 | LF | 39.00 | 198,900 |
| 4" Shut off | 4 | EA | 1,025.00 | 4,100 |
| 6" Shut off | 4 | EA | 1,185.00 | 4,740 |
| Misc. Valve | 1 | LS | 10,000.00 | 10,000 |
| Underground Fire Prot. Service: | | | | |
| 6" | 10 | LF | 110.00 | 1,100 |
| Coring and firesafing | 1 | LS | 5,000.00 | 5,000 |
| Staging and Lifts | 1 | LS | 30,000.00 | 30,000 |
| Test, as built | 1 | LS | 40,000.00 | 40,000 |
| | | | | 893,565 |

DIVISION 22 - PLUMBING

220001 PLUMBING*

| | | | | |
|---|---|---|---|---|
| Plumbing Fixtures ( Per Plumbing): | | | | |
| P-1 water closet | 20 | EA | 1,850.00 | 37,000 |
| P-1A water closet | 31 | EA | 1,850.00 | 57,350 |
| P-2 Urinal | 18 | EA | 1,575.00 | 28,350 |
| P-2A Urinal | 8 | EA | 1,575.00 | 12,600 |
| P-3 Lav ctr mtd | 47 | EA | 1,100.00 | 51,700 |
| P-3A Lav wall hung | 31 | EA | 1,375.00 | 42,625 |
| P-4 Drinking Fountain (high/low) | 11 | EA | 3,150.00 | 34,650 |
| P-5 Mop Receptor | 5 | EA | 1,425.00 | 7,125 |
| P-6 Shower 3x3 | 1 | EA | 2,850.00 | 2,850 |
| P-6 Shower 5x3 | 2 | EA | 3,000.00 | 6,000 |
| P-7 Science | 40 | EA | 2,200.00 | 88,000 |
| P-7A | 2 | EA | 2,200.00 | 4,400 |
| P - 8 | 4 | EA | 1,500.00 | 6,000 |
| P - 9 Art Sink w/ Plaster Trap | 4 | EA | 2,150.00 | 8,600 |
| P - 10 Eye Wash Station | 5 | EA | 2,800.00 | 14,000 |
| Sink - Aud. dressing rm | 4 | EA | 1,500.00 | 6,000 |
| Sink - health office | 1 | EA | 1,500.00 | 1,500 |
| Sink - SPED | 1 | EA | 1,500.00 | 1,500 |
| Sink - Tech Lab | 2 | EA | 1,500.00 | 3,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Sensor Faucet ( spec only) | 78 | EA | 525.00 | 40,950 |
| Sensor Flush ( spec ‹not indicated | 77 | EA | 485.00 | 37,345 |
| FPSC wall hydrant | 8 | EA | 450.00 | 3,600 |
| HB hose bibb | 18 | EA | 350.00 | 6,300 |
| IMB Conn | 5 | EA | 500.00 | 2,500 |
| Fix Connection | 237 | EA | 300.00 | 71,100 |
| Misc. Specialties: | | | | |
| MV-1 | 1 | EA | 7,500.00 | 7,500 |
| MV-2 - science room | 5 | EA | 1,250.00 | 6,250 |
| 1" Mech BFP | 3 | EA | 950.00 | 2,850 |
| Misc. Mix valve | 4 | EA | 450.00 | 1,800 |
| P - 11 Fume Hood Connection | 3 | EA | 2,500.00 | 7,500 |
| Heat Trace non potable water ( spec ) | 1 | LS | 5,000.00 | 5,000 |
| Fire sealing penetration | 1 | LS | 45,000.00 | 45,000 |
| Elevator Sump pump | 1 | EA | 3,500.00 | 3,500 |
| Pumps: | | | | |
| RP-1 & RP-2 | 2 | EA | 15,000.00 | 30,000 |
| RP-3 | 1 | EA | 4,500.00 | 4,500 |
| RP-4 | 1 | EA | 4,500.00 | 4,500 |
| Gas Fire Hot Water Supply Boiler: | | | | |
| BLR-1, 2(Lochinvar - Armor AWN501P ) | 2 | LS | 19,500.00 | 39,000 |
| HW Storage Tank | 1 | EA | 18,000.00 | 18,000 |
| Mech Rm Neutralization | 1 | EA | 4,000.00 | 4,000 |
| Boiler Valve and Trim | 1 | LS | 30,000.00 | 30,000 |
| Heat Trace | 1 | LS | 7,500.00 | 7,500 |
| Interior Grease Interceptor: | | | | |
| GI-1 & GI-2 | 2 | EA | 8,500.00 | 17,000 |
| Roof/Storm Drain System | | | | |
| Underground D/W/V Pipe: | | | | |
| 4" | 61 | LF | 46.00 | 2,806 |
| 6" | 75 | LF | 61.00 | 4,575 |
| 8" | 75 | LF | 96.00 | 7,200 |
| 10" | 93 | LF | 110.00 | 10,230 |
| 12" | 19 | LF | 132.00 | 2,508 |
| FCO | 8 | LF | 425.00 | 3,400 |
| Above Ground D/W/V Pipe: | | | | |
| 4" | 230 | LF | 48.00 | 11,040 |
| 6" | 932 | LF | 63.00 | 58,716 |
| 8" | 486 | LF | 99.50 | 48,357 |
| 10" | 150 | LF | 112.00 | 16,800 |
| CO | 20 | EA | 400.00 | 8,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| RD - 4" | 7 | EA | 1,275.00 | 8,925 |
| RD - 5" | 3 | EA | 1,320.00 | 3,960 |
| RD - 6" | 9 | EA | 1,460.00 | 13,140 |
| RD - 8" | 2 | EA | 1,545.00 | 3,090 |
| Insulate leader | 1,000 | LF | 13.00 | 13,000 |
| Footing drain | 100 | LF | 36.50 | 3,650 |
| Acid Waster System: | | | | |
| Underground D/W/V Pipe: | | | | |
| 2" | 43 | LF | 41.00 | 1,763 |
| 4" | 587 | LF | 62.00 | 36,394 |
| FCO | 6 | EA | 485.00 | 2,910 |
| FD | 5 | EA | 725.00 | 3,625 |
| Above Ground Sanitary D/W/V Pipe: | | | | |
| 4" | 1,200 | LF | 67.00 | 80,400 |
| Chip Tank | 6 | EA | 4,500.00 | 27,000 |
| Domestic Piping: | | | | |
| 1 1/2" | 339 | LF | 33.90 | 11,492 |
| 1 1/4" | 754 | LF | 27.80 | 20,961 |
| 1" | 2,900 | LF | 23.65 | 68,585 |
| 1/2" | 1,245 | LF | 18.10 | 22,535 |
| 2 1/2" | 533 | LF | 66.00 | 35,178 |
| 2" | 735 | LF | 48.20 | 35,427 |
| 3" | 50 | LF | 89.00 | 4,450 |
| 3/4" | 1,590 | LF | 20.60 | 32,754 |
| 6" | 100 | LF | 162.00 | 16,200 |
| Kitchen conn | 1 | LS | 30,000.00 | 30,000 |
| Water Hammer arrestors | 1 | LS | 5,000.00 | 5,000 |
| 1" Pipe Insulation: | | | | |
| 1 1/2" | 339 | LF | 8.00 | 2,712 |
| 1 1/4" | 754 | LF | 7.90 | 5,957 |
| 1" | 2,900 | LF | 7.50 | 21,750 |
| 1/2" | 1,245 | LF | 7.10 | 8,840 |
| 2 1/2" | 533 | LF | 9.00 | 4,797 |
| 2" | 735 | LF | 8.45 | 6,211 |
| 3" | 50 | LF | 9.50 | 475 |
| 3/4" | 1,590 | LF | 7.40 | 11,766 |
| 6" | 100 | LF | 14.45 | 1,445 |
| Sanitary System | | | | |
| Underground D/W/V Pipe: | | | | |
| 2" | 79 | LF | 32.00 | 2,528 |
| 3" | 392 | LF | 38.00 | 14,896 |
| 4" | 971 | LF | 49.00 | 47,579 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 5" | 284 | LF | 56.00 | 15,904 |
| 6" | 14 | LF | 63.00 | 882 |
| 8" | 31 | LF | 99.50 | 3,085 |
| Floor Drain | 17 | EA | 580.00 | 9,860 |
| Gas and Sand separator | 1 | EA | 15,000.00 | 15,000 |
| 5,000 gal. Grease Trap | 1 | EA | 22,000.00 | 22,000 |
| Sewer manhole | 1 | EA | 4,000.00 | 4,000 |
| Floor Sink | 8 | EA | 2,200.00 | 17,600 |
| FCO | 25 | EA | 425.00 | 10,625 |
| | | | | |
| Above Ground D/W/V Pipe: | | | | |
| 2" | 1,600 | LF | 32.00 | 51,200 |
| 3" | 600 | LF | 38.00 | 22,800 |
| 4" | 1,249 | LF | 49.00 | 61,201 |
| FD | 18 | EA | 800.00 | 14,400 |
| CO | 20 | EA | 495.00 | 9,900 |
| Trap primer Pipe | 1 | LS | 5,000.00 | 5,000 |
| Roof Vent Term. | 8 | EA | 1,100.00 | 8,800 |
| | | | | |
| Gas Pipe: | | | | |
| 1" - Science hw conn? | 300 | LF | 36.00 | 10,800 |
| 2" - main | 135 | LF | 75.00 | 10,125 |
| 3/4" - kitchen | 50 | LF | 30.00 | 1,500 |
| 1" - 1/2' lab connection | 1 | RM | 30,000.00 | 30,000 |
| Kitchen Connection | 1 | LS | 5,000.00 | 5,000 |
| Boiler Room Connections | 1 | LS | 5,000.00 | 5,000 |
| Kitchen Master Shut off | 1 | LS | 4,000.00 | 4,000 |
| Gas sub metering | 3 | EA | 3,000.00 | 9,000 |
| | | | | |
| Flues: | | | | |
| | | | | |
| 6" HW Flue | 60 | LF | 95.00 | 5,700 |
| | | | | |
| Generator: | | | | |
| Gas Connection | 1 | LS | 25,000.00 | 25,000 |
| Exhaust Breeching | | NIC | | |
| | | | | |
| Underground Water Service: | | | | |
| 6" | 10 | LF | 150.00 | 1,500 |
| Meter Install Only | 1 | EA | 2,500.00 | 2,500 |
| Sub-meter | 3 | EA | 3,000.00 | 9,000 |
| 6" BFP | 1 | EA | 12,500.00 | 12,500 |
| Staging and Lifts | 1 | LS | 30,000.00 | 30,000 |
| Commissioning Coordination | 200 | HRS | 125.00 | 25,000 |
| Sanitize system | 1 | LS | 25,000.00 | 25,000 |
| Test , permit misc gc | 1 | LS | 75,000.00 | 75,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | 2,150,852 |
| DIVISION 23 - HVAC | | | | |
| 230001 HVAC* | | | | |
| Rooftop Units: | | | | |
| RTU-1 (22,000 cfm) | 20,000 | CFM | 15.00 | 300,000 |
| RTU-2 (22,000 cfm) | 20,000 | CFM | 15.00 | 300,000 |
| RTU-3 (22,000 cfm) | 20,000 | CFM | 15.00 | 300,000 |
| RTU-4 (22,000 cfm) | 20,000 | CFM | 15.00 | 300,000 |
| RTU-5 (15,000 cfm) | 15,000 | CFM | 15.00 | 225,000 |
| RTU-6 (12,000 cfm) | 12,000 | CFM | 15.00 | 180,000 |
| RTU-7 (2,000 cfm) | 2,000 | CFM | 13.50 | 27,000 |
| Make Up Air Units: | | | | |
| MAU-1 (5,000 cfm) | 4,170 | CFM | 12.00 | 50,040 |
| Sound Attenuators ( 17 ea ) | 218,000 | CFM | 0.55 | 119,900 |
| Exhaust Fans: | | | | |
| EF-1 G-VG - roof | 1 | EA | 3,150.00 | 3,150 |
| EF-2 G-VG - roof | 1 | EA | 3,150.00 | 3,150 |
| EF-3 G-VG - roof | 1 | EA | 3,150.00 | 3,150 |
| EF-4 G-VG - roof | 1 | EA | 3,150.00 | 3,150 |
| EF-5 SQ-VG - kiln | 1 | EA | 2,850.00 | 2,850 |
| SEF-1 QEI - roof | 1 | EA | 22,000.00 | 22,000 |
| SEF-2 QEI - roof | 1 | EA | 22,000.00 | 22,000 |
| SEF-3 QEI - roof | 1 | EA | 22,000.00 | 22,000 |
| SEF-4 QEI - roof | 1 | EA | 22,000.00 | 22,000 |
| KEF-1 Cube - roof | 1 | EA | 5,500.00 | 5,500 |
| KEF-2 Cube - roof | 1 | EA | 5,500.00 | 5,500 |
| FEF-1 Vektor - roof | 1 | EA | 12,250.00 | 12,250 |
| FEF-2 Vektor - roof | 1 | EA | 12,250.00 | 12,250 |
| FEF-3 Vektor - roof | 1 | EA | 12,250.00 | 12,250 |
| FEF-4 Vektor - roof | 1 | EA | 12,250.00 | 12,250 |
| FEF-5 Vektor - roof | 1 | EA | 12,250.00 | 12,250 |
| Dust Collection: | | | | |
| DC-1 | 1 | EA | 35,000.00 | 35,000 |
| Dust Connection: | | | | |
| Bandsaw | 1 | EA | 2,500.00 | 2,500 |
| Combo sander | 1 | EA | 2,500.00 | 2,500 |
| Planer | 1 | EA | 2,500.00 | 2,500 |
| Table swa | 1 | EA | 2,500.00 | 2,500 |
| Jointer | 1 | EA | 2,500.00 | 2,500 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Miter saw | 1 | EA | 2,500.00 | 2,500 |
| HW System: | | | | |
| HWB-1 (AR 4,000) | 1 | EA | 52,500.00 | 52,500 |
| HWB-2 (AR 4,000) | 1 | EA | 52,500.00 | 52,500 |
| HWP-1,2 | 2 | EA | 15,000.00 | 30,000 |
| BP 1,2 | 2 | EA | 2,250.00 | 4,500 |
| VFD | 2 | EA | 3,200.00 | 6,400 |
| Chemical feed | 1 | LS | 35,000.00 | 35,000 |
| Air separator | 1 | EA | 2,800.00 | 2,800 |
| Expansion tank | 1 | EA | 3,200.00 | 3,200 |
| 8" Feed Manifold | 50 | LF | 350.00 | 17,500 |
| 6" Manifold S&R | 100 | LF | 225.00 | 22,500 |
| Boiler piping trim and valves | 1 | LS | 26,000.00 | 26,000 |
| 10" Flue | 365 | LF | 185.00 | 67,525 |
| Flue Roof Term and Mast | 4 | EA | 1,500.00 | 6,000 |
| PH Tank | 1 | LS | 1,500.00 | 1,500 |
| Intake Louver and Damper | 1 | LS | 6,000.00 | 6,000 |
| Exhaust Louver and Damper | 1 | LS | 6,000.00 | 6,000 |
| 10" Boiler flue | 275 | LF | 160.00 | 44,000 |
| Elec Room Exhaust fan and Louver | 1 | LS | 3,500.00 | 3,500 |
| Air-Cooled Chiller: | | | | |
| CH - 1 | 370 | TON | 1,050.00 | 388,500 |
| Chiller rough in, valve and trim | 1 | LS | 20,000.00 | 20,000 |
| Pump Package | 1 | LS | 175,000.00 | 175,000 |
| Ductwork: | | | | |
| Galv Ductwork | 136,090 | LBS | 10.50 | 1,428,945 |
| Stainless Steel - welded | 4,000 | LBS | 25.00 | 100,000 |
| Premium for perf atruium ducts | 1 | LS | 25,000.00 | 25,000 |
| 20" Fabric duct soc | 402 | LF | 36.50 | 14,673 |
| 24" Fabric duct soc | 302 | LF | 41.00 | 12,382 |
| Kitchen hood exhaust duct - welded | 2,918 | LBS | 17.50 | 51,065 |
| Alum. dishwasher ductwork | 750 | LBS | 12.00 | 9,000 |
| 1" Duct insul | 48,376 | SF | 4.10 | 198,342 |
| Duct Liner | 8,025 | SF | 6.25 | 50,156 |
| Matt white Rigid duct insul; | 20,000 | SF | 6.80 | 136,000 |
| EPDM wrap | 9,055 | SF | 12.00 | 108,660 |
| 2 HR Fire wrap - dbl wrap | 849 | SF | 16.20 | 13,754 |
| Plenum Air Intake | | | | |
| Alum Louver | carried w/ exterior | | | |
| Motor Op damper | 19 | EA | 4,500.00 | 85,500 |
| Ducted Plenum intake | 19 | EA | 3,000.00 | 57,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Air Devices: | | | | |
| DD - 1 | 39 | EA | 450.00 | 17,550 |
| DD - 2 | 116 | EA | 575.00 | 66,700 |
| DD - 3 | 22 | EA | 375.00 | 8,250 |
| DD - 4 | 7 | EA | 310.00 | 2,170 |
| DD - 5 | 5 | EA | 875.00 | 4,375 |
| DD - 6 | 4 | EA | 600.00 | 2,400 |
| DD - 7 | 40 | EA | 775.00 | 31,000 |
| DD - 8 | 3 | EA | 825.00 | 2,475 |
| DD - 9 | 4 | EA | 975.00 | 3,900 |
| E - 1 | 57 | EA | 195.00 | 11,115 |
| R - 1 | 86 | EA | 185.00 | 15,910 |
| R - 2 | 7 | EA | 195.00 | 1,365 |
| SA - 1 | 14 | EA | 220.00 | 3,080 |
| VAV Box | 150 | EA | 1,250.00 | 187,500 |
| CV Regulator | 32 | EA | 980.00 | 31,360 |
| Volume Damper | 47 | EA | 245.00 | 11,515 |
| Auto Damper | 16 | EA | 1,400.00 | 22,400 |
| Fire damper | 30 | EA | 550.00 | 16,500 |
| Destratification fan | 3 | EA | 8,500.00 | 25,500 |
| AC Split System: | | | | |
| Ductless Cooling Unit Systems: | | | | |
| DCUe-1 | 1 | EA | 7,800.00 | 7,800 |
| DCUe-2 | 1 | EA | 10,500.00 | 10,500 |
| DCUe-3 | 1 | EA | 10,500.00 | 10,500 |
| DCUe-4 | 1 | EA | 9,500.00 | 9,500 |
| DCUe-5 | 1 | EA | 9,500.00 | 9,500 |
| DCUe-6 | 1 | EA | 9,500.00 | 9,500 |
| DCUe-7 | 1 | EA | 9,500.00 | 9,500 |
| DCUe-8 | 1 | EA | 9,500.00 | 9,500 |
| Condensate Pumps: | | | | |
| CP-1 & Cond. Piping | 8 | EA | 1,200.00 | 9,600 |
| Hydraunic Heater: | | | | |
| Unit Heater | 16 | EA | 1,100.00 | 17,600 |
| RP - 1 | 1,341 | LF | 156.00 | 209,196 |
| RP - 2 | 92 | LF | 156.00 | 14,352 |
| FTR - 1 | 602 | LF | 68.00 | 40,936 |
| FTR - 2 | 320 | LF | 68.00 | 21,760 |
| FT Cover | 934 | LF | 27.00 | 25,218 |
| Modulating Valve | 135 | EA | 285.00 | 38,475 |
| Isolation valve | 270 | EA | 92.00 | 24,840 |
| Electric Fin Tube Heater | 8 | EA | 950.00 | 7,600 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Piping: | | | | |
| 1 1/2" | 1,031 | LF | 33.25 | 34,281 |
| 1 1/4" | 897 | LF | 27.30 | 24,488 |
| 1" | 2,139 | LF | 22.00 | 47,058 |
| 2 1/2" | 723 | LF | 66.00 | 47,718 |
| 2" | 1,516 | LF | 44.00 | 66,704 |
| 3" | 504 | LF | 91.00 | 45,864 |
| 3/4" | 7,788 | LF | 19.50 | 151,866 |
| 4" | 967 | LF | 103.00 | 99,601 |
| 6" | 1,374 | LF | 144.50 | 198,543 |
| 8" | 243 | LF | 187.00 | 45,441 |
| 1" Pipe Insulation: | | | | |
| 1 1/2" | 1,031 | LF | 8.00 | 8,248 |
| 1 1/4" | 897 | LF | 7.90 | 7,086 |
| 1" | 2,139 | LF | 7.50 | 16,043 |
| 2 1/2" | 723 | LF | 9.00 | 6,507 |
| 2" | 1,516 | LF | 8.45 | 12,810 |
| 3" | 504 | LF | 9.50 | 4,788 |
| 3/4" | 7,788 | LF | 7.40 | 57,631 |
| 4" | 967 | LF | 11.90 | 11,507 |
| 6" | 1,374 | LF | 14.45 | 19,854 |
| 8" | 243 | LF | 16.25 | 3,949 |
| Mechanical Piping: | | | | |
| AHU Valving | 8 | EA | 3,500.00 | 28,000 |
| Misc. Control Valve | 8 | EA | 2,500.00 | 20,000 |
| Temperature Control: | | | | |
| AHU/ERV | 8 | EA | 25,000.00 | 200,000 |
| Chiller and Cooling Equipment | 1 | LS | 30,000.00 | 30,000 |
| Boiler and Heating | 1 | LS | 20,000.00 | 20,000 |
| Pump | 6 | EA | 1,800.00 | 10,800 |
| VAV | 156 | EA | 1,500.00 | 234,000 |
| Hydronic point | 135 | EA | 750.00 | 101,250 |
| Exhaust Fan | 17 | EA | 1,500.00 | 25,500 |
| AC Split | 8 | EA | 750.00 | 6,000 |
| CO2 Sensor | 119 | EA | 650.00 | 77,350 |
| T stat | 188 | EA | 485.00 | 91,180 |
| Misc. temp control | 1 | LS | 50,000.00 | 50,000 |
| Seismic & vibrator control | 1 | LS | 35,000.00 | 35,000 |
| Test and balance | 136,600 | GSF | 0.65 | 88,790 |
| Staging and Lifts | 1 | LS | 30,000.00 | 30,000 |
| Commission coordination | 1 | LS | 25,000.00 | 25,000 |
| GC & misc. | 1 | LS | 25,000.00 | 25,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | 8,247,841 |
| DIVISION 26 - ELECTRICAL | | | | |
| 260001 ELECTRICAL* | | | | |
| Lighting Fixtures: | | | | |
| Exit | 43 | EA | 324.20 | 13,941 |
| G$ - gym | 80 | EA | 837.00 | 66,960 |
| LC3 - classroom cove | 1,927 | LF | 97.76 | 188,384 |
| LK24 | 15 | EA | 267.00 | 4,005 |
| LP4 | 6 | EA | 452.00 | 2,712 |
| LP4S - aud | 81 | EA | 775.00 | 62,775 |
| LP8 | 6 | EA | 836.40 | 5,018 |
| LR2 - typical | 763 | EA | 402.00 | 306,726 |
| LRD 5 - bathroom | 12 | EA | 1,119.00 | 13,428 |
| LRS - corridor | 104 | EA | 783.60 | 81,494 |
| LS2 | 2 | EA | 332.00 | 664 |
| LS4 | 53 | EA | 362.00 | 19,186 |
| LS8 | 17 | EA | 526.40 | 8,949 |
| LWS - bathroom cove | 647 | LF | 84.10 | 54,413 |
| RC-1 | 92 | EA | 267.00 | 24,564 |
| RSH | 1 | EA | 282.00 | 282 |
| SC - commons | 40 | EA | 888.00 | 35,520 |
| SL4 - exterior | 19 | EA | 507.80 | 9,648 |
| UC (as shown only ) | 66 | LF | 50.40 | 3,326 |
| Branch Wiring | 136,000 | SF | 1.25 | 170,000 |
| Lighting Control System | 136,000 | SF | 2.00 | 272,000 |
| Mechanical: | | | | |
| VAV 20A 1 frac | 89 | EA | 182.20 | 16,216 |
| WH 20A 1 1a | 3 | EA | 182.20 | 547 |
| WH 30A-3P-250v | 1 | EA | 344.00 | 344 |
| GB 30A-3P-250v | 2 | EA | 611.00 | 1,222 |
| J$M | 3 | EA | 182.20 | 547 |
| Meters & flows & solen $M WP | 14 | EA | 182.20 | 2,551 |
| MC-14/2 W/G | 1,500 | LF | 1.69 | 2,529 |
| MC-12/2 W/G | 1,900 | LF | 1.71 | 3,241 |
| MC-12/3 W/G | 1,400 | LF | 2.14 | 2,996 |
| MC-12/4 W/G | 1,180 | LF | 2.56 | 3,026 |
| MC-10/4 W/G | 400 | LF | 4.56 | 1,825 |
| UH | 21 | EA | 182.20 | 3,826 |
| EMT 3/4"C-3#12 | 2,800 | LF | 5.34 | 14,952 |
| VFD FBO I&W | 17 | EA | 216.00 | 3,672 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 25 - 100/100A/3/480v | 4 | EA | 466.00 | 1,864 |
| EMT-1 1/2"C-4#2 & 1#8 | 500 | LF | 15.76 | 7,880 |
| GFI WP roof | 22 | EA | 97.00 | 2,134 |
| Roof stonco | 10 | EA | 228.00 | 2,280 |
| WP roof Switch | 10 | EA | 87.00 | 870 |
| EMT-3/"C-3#12 (roof) | 3,450 | LF | 5.32 | 18,354 |
| EMT-3/"C-4#12 (roof) | 3,100 | LF | 5.80 | 17,980 |
| CP-1 | 11 | EA | 182.20 | 2,004 |
| MC-12/2 W/G | 700 | LF | 1.71 | 1,194 |
| JB 8x8x4 | 11 | EA | 68.20 | 750 |
| 480v 3 30A | 11 | EA | 706.00 | 7,766 |
| 480v 3 40A | 2 | EA | 938.00 | 1,876 |
| EUH 250v 1 30A/2P | 3 | EA | 416.00 | 1,248 |
| ECU 208v 1 15A | 11 | EA | 182.20 | 2,004 |
| DCU J 208v 1 30A | 11 | EA | 436.00 | 4,796 |
| EMT-3/4"C-4#10 | 1,200 | LF | 6.38 | 7,656 |
| ET 120v 1 | 8 | EA | 182.20 | 1,458 |
| MAU-1 60/40A/3/480v | 1 | EA | 391.00 | 391 |
| EMT-1"C - 4#8 & 1#10 | 70 | LF | 7.14 | 500 |
| Mechanical (cont): | | | | |
| Boiler 20A - 1 30A/2P | 3 | EA | 513.00 | 1,539 |
| Boiler pumps 20A 2P 208v | 3 | EA | 366.00 | 1,098 |
| Chiller 480v 600/600A/3 | 2 | EA | 2,148.00 | 4,296 |
| EMT-3"C - 3#250 mcm & 1#4 | 260 | LF | 32.56 | 8,466 |
| EMT-3/4"C 4$8 & 1#10 | 140 | LF | 8.39 | 1,175 |
| SEF 100/100A/3/480v | 4 | EA | 650.00 | 2,600 |
| #2 MI cable | 1,600 | LF | 19.32 | 30,912 |
| #2 MI terms (quick) | 32 | EA | 116.00 | 3,712 |
| RTU - 400/250A/3/3R | 4 | EA | 971.00 | 3,884 |
| RTU - 200/150A/3/3R | 2 | EA | 613.00 | 1,226 |
| RTU - 100/70A/3/3R | 1 | EA | 486.00 | 486 |
| RTU - 60/50A/3/3R | 1 | EA | 391.00 | 391 |
| EMT-3"C-4#250 & 1#4 | 520 | LF | 40.38 | 20,998 |
| EMT-2"C-4#1/0 & 1#6 | 325 | LF | 21.96 | 7,137 |
| EMT-1 1/4"C-4#4 & 1#8 | 150 | LF | 12.62 | 1,893 |
| EMT-1"C-4#6 & 10 | 150 | LF | 10.25 | 1,538 |
| Wiring Devices & Scoreboard Work: | | | | |
| Duplex | 388 | EA | 58.84 | 22,830 |
| GFI duplex | 109 | EA | 61.84 | 6,741 |
| WP GFI | 8 | EA | 94.00 | 752 |
| Surf double duplex | 37 | EA | 124.00 | 4,588 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Switched rec w/IO module | 24 | EA | 240.00 | 5,760 |
| NEMA L14-20R | 27 | EA | 107.00 | 2,889 |
| LS limit switch | 3 | EA | 107.00 | 321 |
| CP cont pnl - wire only | 8 | EA | 144.00 | 1,152 |
| TML mtr conn | 8 | EA | 83.80 | 670 |
| J 4" sq w/cover | 6 | EA | 41.00 | 246 |
| ISO grd out shot clock | 2 | EA | 87.00 | 174 |
| Wire only scoreboard | 1 | EA | 144.00 | 144 |
| 30/20A/3240v | 2 | EA | 269.00 | 538 |
| EMT-3/4"C-4#12 | 1,800 | LF | 5.79 | 10,422 |
| Double duplex - color | 216 | EA | 101.40 | 21,902 |
| Tw loc @ tray | 11 | EA | 102.00 | 1,122 |
| Cable tray 24"c12'0" | 6 | EA | 309.00 | 1,854 |
| Poke thru | 2 | EA | 666.00 | 1,332 |
| Key sw | 1 | EA | 64.00 | 64 |
| MOM conn cw | 6 | EA | 70.00 | 420 |
| CP bleacher pwr | 7 | EA | 366.00 | 2,562 |
| MC-12/2 w/G | 39,500 | LF | 1.71 | 67,387 |
| MC-12/3 w/G | 2,000 | LF | 2.14 | 4,280 |
| EMT-3/4"C - 3#12 | 1,900 | LF | 5.32 | 10,108 |
| Emergency Generator & ATS: | | | | |
| 300kw 277/480v Natural Gas Generator | 1 | EA | 159,320.00 | 159,320 |
| Enclosure | 1 | EA | 432.00 | 432 |
| 400A/3P output c/b | 1 | EA | 144.00 | 144 |
| 150A/3P output c/b | 1 | EA | 144.00 | 144 |
| Interior panel | 1 | EA | 288.00 | 288 |
| Receive rig & set | 1 | EA | 11,152.00 | 11,152 |
| Unit mtd EPO | 1 | EA | 638.00 | 638 |
| Bldg mtd EPO | 1 | EA | 907.00 | 907 |
| Annunciator | 1 | EA | 576.00 | 576 |
| ATS-OS 400A 4P | 1 | EA | 432.00 | 432 |
| ATS-LS 150A 4P | 1 | EA | 576.00 | 576 |
| PVC-1"C-4#10 & 1#10 | 150 | LF | 4.01 | 602 |
| PVC-1"C-14#13 | 150 | LF | 5.60 | 840 |
| EMT-3/4"C-2#14 | 280 | LF | 5.12 | 1,434 |
| EMT-3/4"C-5#14 | 120 | LF | 6.09 | 731 |
| MI - 4#1/0 | 140 | LF | 107.36 | 15,030 |
| MI - quick terms | 8 | LF | 133.20 | 1,066 |
| WIC 4#500 & 1#3 | 130 | LF | 45.84 | 5,959 |
| EMT-4"C-4#500 & 1#3 | 140 | LF | 67.24 | 9,414 |
| EMT-2"C-4#10 & 1#6 | 150 | LF | 21.96 | 3,294 |
| Fire Alarm System: | | | | |
| Material | 1 | LS | 219,942.00 | 219,942 |
| Bi-directional antenna sys | 1 | LS | 4,752.00 | 4,752 |
| Elevator shaft & machine rm fitout | 1 | LS | 3,456.00 | 3,456 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Floor plan under glass | 3 | LS | 144.00 | 432 |
| Sprinkler bell I&W only | 1 | LS | 216.00 | 216 |
| DK drill key switch | 1 | LS | 72.00 | 72 |
| FACP flush control pnl | 1 | LS | 4,608.00 | 4,608 |
| Red beacon | 1 | LS | 216.00 | 216 |
| As built cabinet | 1 | LS | 144.00 | 144 |
| FM flush master box | 1 | LS | 360.00 | 360 |
| K knox box | 1 | LS | 216.00 | 216 |
| W white strobe | 1 | LS | 144.00 | 144 |
| LOC local operator control pnl | 1 | LS | 864.00 | 864 |
| Smoke exhaust graphic plaque w/LED indicator of statue | 1 | EA | 1,152.00 | 1,152 |
| FATC term cabinet | 3 | EA | 864.00 | 2,592 |
| ANN annunciator | 3 | EA | 432.00 | 1,296 |
| VE voice evac pnl | 1 | EA | 2,304.00 | 2,304 |
| MNS ?? | 3 | EA | 288.00 | 864 |
| LS limit sw | 6 | EA | 72.00 | 432 |
| BD beam det xmit/rcur | 5 | EA | 180.00 | 900 |
| MM monitor module | 66 | EA | 72.00 | 4,752 |
| CM control module | 26 | EA | 72.00 | 1,872 |
| IM isolation module | 3 | EA | 72.00 | 216 |
| CO2 det tie in | 1 | EA | 144.00 | 144 |
| Security tie in | 2 | EA | 144.00 | 288 |
| Refuge tie in | 1 | EA | 144.00 | 144 |
| BDA tie in | 5 | EA | 144.00 | 720 |
| CO MM CO2 det w/monitor mod | 9 | EA | 144.00 | 1,296 |
| Smoke w/base | 89 | EA | 72.00 | 6,408 |
| Smoke to control atrium smoke | 115 | EA | 72.00 | 8,280 |
| Strobe only | 61 | EA | 108.00 | 6,588 |
| A/V unit | 0 | EA | 0.00 | 0 |
| A/V unit w/ amber alert | 270 | EA | 144.00 | 38,880 |
| FS TS flow & tampers | 42 | EA | 72.00 | 3,024 |
| Fire Alarm System ( cont): | | | | |
| F Pull station | 29 | EA | 61.20 | 1,775 |
| MAG door holders | 6 | EA | 72.00 | 432 |
| ST1 stopper II 6500 | 29 | EA | 36.00 | 1,044 |
| J 4" oct j-box | 218 | EA | 33.80 | 7,368 |
| J 4" sq w/device ring | 158 | EA | 42.00 | 6,636 |
| BB back box | 331 | EA | 53.20 | 17,609 |
| Programming & pretest | 1 | EA | 1,728.00 | 1,728 |
| FFD testing & cert | 1 | EA | 1,728.00 | 1,728 |
| ir & smoke test | 1 | EA | 576.00 | 576 |
| Water flow testing | 1 | EA | 576.00 | 576 |
| EMT-3/4"C-4#14 | 1,200 | LF | 5.42 | 6,504 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| AFC-#4901-16/2 14/2 | 13,160 | LF | 4.46 | 58,694 |
| MC-4/C#14 red jacket | 13,240 | LF | 2.64 | 34,954 |
| Induct smoke | 40 | EA | 288.00 | 11,520 |
| Rem test sat | 40 | EA | 108.00 | 4,320 |
| Relay modules | 40 | EA | 72.00 | 2,880 |
| Monitor modules | 40 | EA | 72.00 | 2,880 |
| Mass notif UL listed computer | 1 | LS | 50,000.00 | 50,000 |
| Kitchen Power & Conns: | | | | |
| S clg speaker | 9 | EA | 381.00 | 3,429 |
| Wall clock | 1 | EA | 247.00 | 247 |
| Voice outlet | 1 | EA | 225.00 | 225 |
| Duplex | 36 | EA | 59.84 | 2,154 |
| J | 36 | EA | 92.00 | 3,312 |
| TML-3/4"C-3#12 | 46 | EA | 50.24 | 2,311 |
| TML-3/4"C-4#12 | 2 | EA | 61.00 | 122 |
| TML-3/4"C-5#12 | 3 | EA | 69.60 | 209 |
| TML-3/4"C-4#10 | 2 | EA | 81.80 | 164 |
| TML-1 1/4"C-4#4 & 1#/0 | 2 | EA | 132.00 | 264 |
| 60/50/3/250v | 2 | EA | 286.00 | 572 |
| 30/20/3/250v | 1 | EA | 228.00 | 228 |
| 30/3P/250v | 2 | EA | 208.00 | 416 |
| 30/2P/250v | 4 | EA | 198.00 | 792 |
| Ther sw w/OL | 9 | EA | 150.00 | 1,350 |
| EMT-3/4"C-3#12 | 2,000 | LF | 5.32 | 10,640 |
| EMT-3/4"C-4#12 | 100 | LF | 5.78 | 578 |
| EMT-3/4"C-5#12 | 160 | LF | 6.24 | 998 |
| EMT-3/4"C-4#10 | 100 | LF | 6.38 | 638 |
| EMT-1 1/4"C-4#4 & 1#10 | 100 | LF | 13.19 | 1,319 |
| MC-12/2 w/G | 1,500 | LF | 1.85 | 2,775 |
| CO2 gas solenoid shutdown | 1 | LF<br>LS | 3,404.00 | 3,404 |
| Hood/ansul/EP work | 1 | LS | 6,206.00 | 6,206 |
| Master Lightning Protector Systems & Theatre: | | | | |
| Theatrical ltg Rough-in | 1 | LS | 98,780.00 | 98,780 |
| Heary Bros Lightning Preventer Systems | 2 | EA | 13,820.00 | 27,640 |
| Window shade installation | 1 | LS | 10,760.00 | 10,760 |
| Area of refuge system | 1 | LS | 16,676.00 | 16,676 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Integrated Electronic Security: | | | | |
| Material - Turnkey: | 1 | LS | 342,000.00 | 342,000 |
| Includes: | | | | |
| DSC Main cont pnl | 1 | EA | | |
| 12v 7 AH batteries | 2 | EA | | |
| Xfmrs | 2 | EA | | |
| Key lock w/relay mod | 1 | EA | | |
| 8 Zone expansion mod | 1 | EA | | |
| 16 Zone expansion mod | 1 | EA | | |
| Addr. point modules | 12 | EA | | |
| Touchscreen keypad | 4 | EA | | |
| Wireless panic statin | 6 | EA | | |
| Wireless received mod | 1 | EA | | |
| Wall motions | 35 | EA | | |
| Clg motions | 38 | EA | | |
| Interface printer | 1 | EA | | |
| Fargo photo badging | 1 | EA | | |
| Flush door contacts | 50 | EA | | |
| OHD central contacts | 2 | EA | | |
| Cellular communicator | 1 | EA | | |
| 8 Reader controller | 11 | EA | | |
| DSX proximity readers | 18 | EA | | |
| Bosch rte motions | 14 | EA | | |
| DSC lan module/software | 1 | EA | | |
| 160 TB Network video recorder | 1 | EA | | |
| 12MP camera | 13 | EA | | |
| 5 MP ext dome camera | 2 | EA | | |
| Wall arms | 2 | EA | | |
| 5 MP Interior dome | 27 | EA | | |
| 5 MP indoor 360der dome | 29 | EA | | |
| Rack w/receivers/mx mmtrs | 1 | EA | | |
| Axis ect 360 deg camera | 3 | EA | | |
| A1 phone master video | 3 | EA | | |
| A1 phone IC-DF video door sta | 4 | EA | | |
| Strong pole split 20' | 3 | EA | | |
| 43" Smart TV | 2 | EA | | |
| 55" Smart TV | 2 | EA | | |
| Chief TV wall brkt | 4 | EA | | |
| 24 Port poe & sw | 3 | EA | | |
| 28 Port poe & sw | 10 | EA | | |
| Programming | 1 | LS | | |
| Accessories | 1 | LS | | |
| Supervision & final conn | 1 | LS | | |
| O&M manuals | 1 | LS | | |
| Auto Cad dwgs | 1 | LS | | |
| Owner training | 1 | LS | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Structured Cabling System: | | | | |
| Material - turnkey | 1 | LS | 389,939.00 | 389,939 |
| Includes: | | | | |
| ACCU tech TS teacher sta | 70 | EA | | |
| Programming | 1 | EA | | |
| Supervision & final conn | 1 | EA | | |
| O&M manuals w/closeout | 1 | EA | | |
| Auto Cad drawings | 1 | EA | | |
| Owner training | 1 | EA | | |
| 50 PR 66 blocks | 6 | EA | | |
| 25 PR 66 blocks | 6 | EA | | |
| 50 PR 110 blocks | 6 | EA | | |
| Belden 2 post rack | 8 | EA | | |
| Belden rack mt PDU | 8 | EA | | |
| Belden 4 port face plate | 150 | EA | | |
| Belden 2 port face plate | 250 | EA | | |
| Belden F conn insert | 70 | EA | | |
| Belden CAT6A green insert | 400 | EA | | |
| Belden CAT6A blue insert | 400 | EA | | |
| Belden 48 port patch pnl | 12 | EA | | |
| Belden horiz cable mgr | 40 | EA | | |
| Belden 10' patch cord | 800 | EA | | |
| Belden CAT6A plenum blue | 100 | EA | | |
| Belden CAT6A plenum green | 100 | EA | | |
| Belden OS2 sm patch cord | 100 | EA | | |
| Belden OM4 mm patch cord | 100 | EA | | |
| Belden 4 cassettes hsg | 8 | EA | | |
| Belden 6 fiber hsg | 8 | EA | | |
| Belden 18 fiber hsg | 8 | EA | | |
| Ground bars w/grd cable | 1 | LS | 23,640.00 | 23,640 |
| Conduit sleeves, cable tray and fiber backbone | 1 | LS | 30,960.00 | 30,960 |
| Intercom & Clock Systems: | | | | |
| Material - turnkey | 1 | LS | 119,970.00 | 119,970 |
| Includes: | | | | |
| Valcom 9 position back plane | 1 | EA | | |
| Valcom main power supply | 2 | EA | | |
| Valcom main VPV | 1 | EA | | |
| Valcom Rack mount kit | 1 | EA | | |
| Valcom dual 6A switching | 1 | EA | | |
| Valcom 2x2 talkback spkr | 240 | EA | | |
| Valcom call in pushbutton | 66 | EA | | |
| Valcom GPS master clock | 1 | EA | | |
| Valcom repeater | 2 | EA | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Valcom 12" round clocks | 84 | EA | | |
| Valcom administrative teleph | 1 | EA | | |
| Valcom 16" clocks/repeater | 2 | EA | | |
| Valcom wire guard | 2 | EA | | |
| Valcom power supply | 1 | EA | | |
| Cowell rack equip | 1 | LS | | |
| Atlas paging horns | 21 | EA | | |
| Atlas flush enclosures | 21 | EA | | |
| Atlas grills | 21 | EA | | |
| Valcom retro blocks | 3 | EA | | |
| Valcom power amps | 3 | EA | | |
| Valcom rack mount kit | 3 | EA | | |
| Valcom 24 pt talk back | 3 | EA | | |
| Valcom admin gateway | 1 | EA | | |
| Valcom volume control | 21 | EA | | |
| Valcom network port/cards | 1 | EA | | |
| Programming | 1 | LS | | |
| Supervisions & final conn | 1 | LS | | |
| O&M manuals & closeout | 1 | LS | | |
| Auto cad swgs & submit | 1 | LS | | |
| System testing | 1 | LS | | |
| System owner training | 1 | LS | | |
| | | | | |
| A/V Systems: | | | | |
| FSR | 1 | EA | 951.40 | 951 |
| Clg proj | 1 | EA | 700.00 | 700 |
| Duplex | 41 | EA | 60.84 | 2,494 |
| Data drop | 43 | EA | 250.00 | 10,750 |
| Hardwired AC pwr | 2 | EA | 97.00 | 194 |
| Chief PAC 526 | 3 | EA | 741.00 | 2,223 |
| VI Wall proj IG deep | 41 | EA | 44.00 | 1,804 |
| SI Wall spkr 1G deep | 82 | EA | 44.00 | 3,608 |
| RI Rec pnl 2G deep | 42 | EA | 57.80 | 2,428 |
| BP ?? 2G deep | 42 | EA | 57.80 | 2,428 |
| | | | | |
| J1 12'x12'x4" flush | 2 | EA | 203.00 | 406 |
| R2 2 gang deep | 4 | EA | 74.00 | 296 |
| R3 3 gang deep | 4 | EA | 82.00 | 328 |
| | | | | |
| S2 clg loud spkr - b.box | 10 | EA | 74.00 | 740 |
| S3 clg loud spkr - b.box | 8 | EA | 74.00 | 592 |
| EMT-1 1/4"C- w/PS | 480 | LF | 7.66 | 3,677 |
| EMT-1 "C- w/PS | 300 | LF | 6.19 | 1,857 |
| EMT-3/4"C- w/PS | 2,500 | LF | 4.63 | 11,575 |
| | | | | |
| Section 274100 A/V | | | | |
| Includes Systems for: | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Classrooms | | NIC | | |
| Auditorium | | w/equipment | | |
| Auditorium av Rough-in | 1 | EA | 45,000.00 | 45,000 |
| Switchgear Panels & Transformers: | | | | |
| 45 KVA xfmr | 8 | EA | 5,232.00 | 41,856 |
| 75 KVA xfmr | 6 | EA | 7,540.00 | 45,240 |
| Xfmr ground | 14 | EA | 394.00 | 5,516 |
| 100A/3P/480v | 3 | EA | 304.00 | 912 |
| 200A/3P/480v | 3 | EA | 372.00 | 1,116 |
| SFD 2500A @ 480v | 1 | EA | 1,788.00 | 1,788 |
| SPD panel mounted | 39 | EA | 422.00 | 16,458 |
| SPD grounds | 40 | EA | 172.00 | 6,880 |
| Elev controller | 1 | EA | 144.00 | 144 |
| 100/100A/3P/480v | 1 | EA | 339.00 | 339 |
| 30/20A/3P/208v | 1 | EA | 218.00 | 218 |
| TML 40 | 1 | EA | 204.00 | 204 |
| 100A/3/250v | 1 | EA | 274.00 | 274 |
| UPS system 24 kw | 1 | EA | 24,880.00 | 24,880 |
| Rigging for UPS | 1 | EA | 2,432.00 | 2,432 |
| EPO power off setup | 1 | EA | 274.00 | 274 |
| ST1 6500 guard | 1 | EA | 127.00 | 127 |
| Main service grounding | 1 | EA | 822.00 | 822 |
| Meter socket | 1 | EA | 544.00 | 544 |
| Main swbrd 3000A @ 480v | 1 | EA | 40,896.00 | 40,896 |
| Feeders | 136,000 | EA | 1.95 | 265,200 |
| Dist pnl 4DP1B-800A @ 480v | 1 | EA | 7,248.00 | 7,248 |
| Dist pnl 2DP1C-400A @ 208v | 1 | EA | 5,160.00 | 5,160 |
| Double tub pnl @ 120/208v | 10 | EA | 3,890.00 | 38,900 |
| Single tub pnl @ 120/208v | 12 | EA | 2,752.00 | 33,024 |
| 400A-480v pnl | 3 | EA | 5,072.00 | 15,216 |
| 225A-480v pnl | 3 | EA | 3,052.00 | 9,156 |
| 100A-480v pnl | 8 | EA | 2,688.00 | 21,504 |
| DENIS VERIFY SECONDARY FEED | | | | |
| 60% CD Adders/Deletes: | | | | |
| Integrated Electronic Security - 60% Adders/Deducts: | | | | |
| Turnkey - Includes: | 1 | EA | 27,000.00 | 27,000 |
| Reader controller - add | 1 | EA | | |
| Elevator controller - add | 3 | EA | | |
| CR REX DC DC PS - add | 1 | EA | | |
| CR DC REX PS - add | 3 | EA | | |
| Wall motions - add | 9 | EA | | |
| Ext. wall camera - add | 1 | EA | | |
| Int. dome camera - add | 1 | EA | | |
| Int. 180 deg - add | 30 | EA | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Ext. 180 deg - add | 14 | EA | | |
| Int. 360 deg - deduct | -29 | EA | | |
| Ext. 360 deg - deduct | -9 | EA | | |
| VES - add | 1 | EA | | |
| VMS - deduct | -2 | EA | | |
| OHD - DC - add | 2 | EA | | |
| Structured Cabling - 60% Adders/Deducts: | | | | |
| Turnkey - Includes: | 1 | LS | 97,000.00 | 97,000 |
| IDE closets - reduced | -1 | EA | | |
| Teachers station - add | 1 | EA | | |
| TVE - add | 4 | EA | | |
| AN - add | 115 | EA | | |
| N2D - delete | -7 | EA | | |
| 2 Data - add | 39 | EA | | |
| TVS-48 | 3 | EA | | |
| TVC-96 | 1 | EA | | |
| CAT 6A ports | 1,135 | EA | | |
| 48 Port patch pnls | 15 | EA | | |
| P.A. & Intercom - 60% CD Adders: | | | | |
| Turnkey - Includes: | 1 | LS | 20,000.00 | 20,000 |
| Speakers - add | 41 | EA | | |
| Volume control - add | 6 | EA | | |
| 12" Clocks - add | 8 | EA | | |
| Ext. flush horn spkrs - add | 2 | EA | | |
| #of classrooms - reduced | -9 | EA | | |
| IDF closets - reduced | -1 | EA | | |
| Fire Alarm & Gear - 60% Adders/Deducts: | | | | |
| FA - A/V w/ amber alert | 7 | EA | 419.00 | 2,933 |
| S - smoke w/base | 3 | EA | 162.00 | 486 |
| W WP - A/V - WP | 1 | EA | 271.00 | 271 |
| BB backbox | 7 | EA | 53.20 | 372 |
| BB WP backbox WP | 1 | EA | 63.40 | 63 |
| J - 4" oct | 3 | EA | 33.80 | 101 |
| AFC - #4901 cable | 300 | LF | 4.46 | 1,338 |
| MC - 14/4C red jacket | 50 | LF | 2.64 | 132 |
| Dist. pnl 2 DP1A - 600A @ 480 | 1 | EA | 7,248.00 | 7,248 |
| Dist. pnl 2 DP1B - 600A @ 480 | 1 | EA | 7,248.00 | 7,248 |
| Upsize ATS-LS from 150 to 200A | 1 | EA | 1,144.00 | 1,144 |
| Upsize ATS-OS from 400 to 600A | 1 | EA | 3,216.00 | 3,216 |
| Upsize G/S from 250kw to 300 kw | 1 | EA | 5,500.00 | 5,500 |
| Upsize G/S output d/b from 400 to 600A | 1 | EA | 2,000.00 | 2,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| ESL storm sw w/feeder tie | 1 | EA | 6,830.00 | 6,830 |
| Power Wiring Devices - 60% Adders/Deducts: | | | | |
| Duplex | 105 | EA | 58.84 | 6,178 |
| GFI duplex | 23 | EA | 62.84 | 1,445 |
| WP GFI duplex | 18 | EA | 94.00 | 1,692 |
| NEMA CIS 3OR | 1 | EA | 107.00 | 107 |
| 20A GFI - color | 28 | EA | 71.84 | 2,012 |
| Double duplex | 42 | EA | 113.20 | 4,754 |
| MC-10/3 | 60 | LF | 2.83 | 170 |
| $MC | 2 | EA | 70.00 | 140 |
| $DW disc sw - DW | 1 | EA | 82.00 | 82 |
| J - dishwasher | 1 | EA | 96.20 | 96 |
| J - fume hood | 1 | EA | 117.00 | 117 |
| EF | 2 | EA | 182.20 | 364 |
| SEF | 2 | EA | 182.20 | 364 |
| KEF | 1 | EA | 344.00 | 344 |
| FEF | 1 | EA | 344.00 | 344 |
| DCU | 2 | EA | 436.00 | 872 |
| CPJ - bleacher power | 1 | EA | 366.00 | 366 |
| Scoreboard power & cont. | 1 | EA | 463.00 | 463 |
| Turnkey - area of refuge AKA 2 way communication | 1 | LS | 14,953.00 | 14,953 |
| 90% CD Adders/Deducts: | | | | |
| Service, Fire Alarm - 90% CD Adders/Deducts: | | | | |
| 24 kw UPS | 1 | EA | 24,380.00 | 24,380 |
| EPO em. pwr off | 1 | EA | 491.00 | 491 |
| Disc sw. | 1 | EA | 344.00 | 344 |
| TEP2B - add section 2 | 1 | EA | 938.00 | 938 |
| MP1A - add section 2 | 1 | EA | 938.00 | 938 |
| Pnl ELIID - F&I new | 1 | EA | 3,296.00 | 3,296 |
| SPD - pnl mtd | 2 | EA | 539.00 | 1,078 |
| PNI - MHP-LR-F&I new | 1 | EA | 3,640.00 | 3,640 |
| ATS - LR-400A 4P | 1 | EA | 7,448.00 | 7,448 |
| Increase gen/set to 350 kw | 1 | EA | 7,000.00 | 7,000 |
| Add output c/b | 1 | EA | 144.00 | 144 |
| Misc. additional feeders | 1 | LS | 27,960.00 | 27,960 |
| MI cable #2 w/terms | 1 | LS | 13,320.00 | 13,320 |
| TS tamper or flow | 23 | EA | 84.00 | 1,932 |
| MM monitor module | 23 | EA | 147.00 | 3,381 |
| F pull station | 5 | EA | 126.20 | 631 |
| F - strobe | 4 | EA | 233.00 | 932 |
| S - smoke | 6 | EA | 162.00 | 972 |
| J | 6 | EA | 30.20 | 181 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| J square | 51 | EA | 36.24 | 1,848 |
| BB | 4 | EA | 46.00 | 184 |
| 4901 cable | 500 | LF | 4.46 | 2,230 |
| 14/4C cable | 2,800 | LF | 2.64 | 7,392 |
| Security & Misc. Wiring Devices - 90% CD Adders/Deducts: | | | | |
| WP - ext. camera | 2 | EA | 1,125.00 | 2,250 |
| Int. camera | 3 | EA | 975.00 | 2,925 |
| CR WP | 3 | EA | 1,295.00 | 3,885 |
| IC WP | 1 | EA | 978.00 | 978 |
| Door setups - box & conduit | 4 | EA | 800.00 | 3,200 |
| CR - interior | 5 | EA | 1,295.00 | 6,475 |
| DC | 8 | EA | 275.00 | 2,200 |
| Welder | 1 | EA | 184.00 | 184 |
| Duplex | 79 | EA | 58.84 | 4,648 |
| Duplex - double | 34 | EA | 124.00 | 4,216 |
| CR - clg for cord reel | 8 | EA | 128.00 | 1,024 |
| GFI | 40 | EA | 61.84 | 2,474 |
| Mech conn w/j.box | 1 | EA | 83.80 | 84 |
| G - sw. rec. w/ IL mod. | 15 | EA | 240.00 | 3,600 |
| USB - duplex w/USB outlet | 7 | EA | 133.00 | 931 |
| WP GFI | 1 | EA | 94.00 | 94 |
| Backboard gym setups | 2 | EA | 391.00 | 782 |
| MC-12/2 wG | 10,740 | LF | 1.72 | 18,430 |
| MC-6/3 wG | 100 | LF | 4.16 | 416 |
| Lighting, Controls, Mechanical - 90% CD Adders/Deducts: | | | | |
| LR5D - deleted | -10 | EA | 95.00 | -950 |
| LS4B - deleted | -15 | EA | 375.00 | -5,625 |
| L - LV switch - add | 10 | EA | 230.00 | 2,300 |
| PC1 - add | 16 | EA | 480.00 | 7,680 |
| PC2 - add | 9 | EA | 480.00 | 4,320 |
| LR4 - deleted | -8 | EA | 450.00 | -3,600 |
| JB wall fixt. - add | 8 | EA | 280.00 | 2,240 |
| LS4 - add | 3 | EA | 362.00 | 1,086 |
| LP8 - add | 3 | EA | 526.00 | 1,578 |
| OS clg occ - add | 4 | EA | 420.00 | 1,680 |
| LR2 - add | 499 | EA | 385.00 | 192,115 |
| LC3 - add | 980 | LF | 97.76 | 95,805 |
| J - 4" oct j-box | 46 | EA | 30.20 | 1,389 |
| Mtg hdwre | 530 | EA | 8.20 | 4,346 |
| MC-12/2 w/ground | 2,000 | LF | 1.72 | 3,432 |
| CH-1 - control conn/heat tape | 2 | EA | 591.00 | 1,182 |
| DCV-8-208v 1 30A | 2 | EA | 713.00 | 1,426 |
| EFT - elec BB 2 kw 208v | 8 | EA | 571.00 | 4,568 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| FEF - F.H. ex fan 480v 3 | 2 | EA | 942.00 | 1,884 |
| KEF-2 - ex. fan 120v 1 | 1 | EA | 541.00 | 541 |
| UH - unit heater 120v 1 | 3 | EA | 541.00 | 1,623 |
| Technology Drawings - 90% CD Adders/Deducts: | | | | |
| AN - wifi | 8 | EA | 275.00 | 2,200 |
| 2 Data | 24 | EA | 300.00 | 7,200 |
| W - wall voice | 21 | EA | 215.00 | 4,515 |
| S clg spkr | 11 | EA | 129.00 | 1,419 |
| S clg spkr | 52 | EA | 189.00 | 9,828 |
| ? | 3 | EA | 295.00 | 885 |
| S | 10 | EA | 129.00 | 1,290 |
| T | 1 | EA | 500.00 | 500 |
| IV/2D | 5 | EA | 385.00 | 1,925 |
| OH&P - 10% | 1 | LS | 500,295.85 | 500,296 |
| DJE | 1 | LS | 150,000.00 | 150,000 |
| Site Electrical Work: | | | | |
| Utilities: | | | | |
| PRI manhole dressing | 1 | EA | 1,576.00 | 1,576 |
| Utility pole PRI & FA dressing | 1 | EA | 1,364.00 | 1,364 |
| Utility pole commun. dressing | 1 | EA | 1,076.00 | 1,076 |
| Gen/set pad grndg | 1 | EA | 982.00 | 982 |
| Xfmr pad grndg | 1 | EA | 1,376.00 | 1,376 |
| Gen/set pad 90 deg. & sleeves | 1 | EA | 566.00 | 566 |
| Xfmr pad 90 deg. & sleeves | 1 | EA | 688.00 | 688 |
| Duct Bank CC: | | | | |
| PVC-4"C - w/PS (120') | 600 | LF | 4.38 | 2,628 |
| PVC-1"C- w/4#12 | 480 | LF | 3.62 | 1,738 |
| Duct Bank AA: | | | | |
| PVC-4"C - w/PS (270') | 540 | LF | 4.38 | 2,365 |
| Duct Bank BB: | | | | |
| PVC-4"C - w/PS (110') | 770 | LF | 4.38 | 3,373 |
| Duct Bank FF: | | | | |
| PVC-4"C - w/PS (120') | 240 | LF | 4.38 | 1,051 |
| Duct Bank Fire Alarm: | | | | |
| PVC-2"C - w/PS (300') | 300 | LF | 2.06 | 618 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| IMSA 20-5 cable | 350 | LF | 3.44 | 1,204 |
| Duct Bank DD (230'): | | | | |
| PVC-4"C - w/PS | 920 | LF | 4.38 | 4,030 |
| Inner duct 1 1/4"C- w/PS | 690 | LF | 2.64 | 1,822 |
| Ext camera on 20' pole | 3 | EA | 5,470.00 | 16,410 |
| Fiber optic w/PVC | 1,000 | LF | 5.88 | 5,880 |
| Pole foundation | 3 | EA | 1,326.00 | 3,978 |
| Electrical Manhole | 2 | EA | 8,500.00 | 17,000 |
| OH&P - 10% | 1 | LS | 6,972.38 | 6,972 |
| DJE | 1 | LS | 20,000.00 | 20,000 |
| Site Lighting: | | | | |
| Lighting Fixtures: | | | | |
| SL1 - 20' pole | 37 | EA | 2,676.00 | 99,012 |
| SL3 - poulson bollard | 9 | EA | 1,812.00 | 16,308 |
| SL4 - egress permeter ltg | 21 | EA | 616.00 | 12,936 |
| SL5 - in ground bega | 16 | EA | 791.00 | 12,656 |
| SL6 - bega flood w/remote driver | 0 | EA | 0.00 | 0 |
| SL10 - mini flood | 0 | EA | 0.00 | 0 |
| SL1A - 20' pole | 4 | EA | 2,676.00 | 10,704 |
| SL3 - wall mtd area lt - MV | 4 | EA | 544.00 | 2,176 |
| HH 12x12x12"d in gr p.box | 3 | EA | 638.00 | 1,914 |
| PB 17"x30"x12"d | 12 | EA | 648.00 | 7,776 |
| PB-24"x36"x24"d w/divider | 2 | EA | 788.00 | 1,576 |
| EV charging station - level 2 | 3 | EA | 3,754.00 | 11,262 |
| J 8x8x4 inter j-box | 3 | EA | 74.00 | 222 |
| T/C 7 dy w/batt pack | 1 | EA | 666.00 | 666 |
| Pipe into & wire to exist pnl | 1 | EA | 144.00 | 144 |
| Demo exist pole w/fixt | 4 | EA | 576.00 | 2,304 |
| Penetrate m bay gym | 1 | EA | 338.00 | 338 |
| Relocated emer call box | 2 | EA | 926.00 | 1,852 |
| Call box base setup | 2 | EA | 241.00 | 482 |
| MC-12/2 w/G-fished | 540 | EA | 1.99 | 1,077 |
| PVC-1"C-3#8 | 9,320 | EA | 3.99 | 37,187 |
| Pole base anchor bolts | 48 | EA | 54.00 | 2,592 |
| Pole base grounding | 48 | EA | 162.00 | 7,776 |
| Pole base sleeves & 90 deg | 48 | EA | 137.00 | 6,576 |
| Bollard base setups | 42 | EA | 122.00 | 5,124 |
| In ground hsg setups | 16 | EA | 112.00 | 1,792 |
| PVC-2 1 /2"C-w/PS | 1,500 | EA | 3.33 | 4,989 |
| PVC-2"C-w/PS | 620 | EA | 2.77 | 1,717 |
| WP pedestal mtd Wayne Tyler CB box | 5 | EA | 1,926.00 | 9,630 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Site - 60% Deducts: | | | | |
| SL5 - Bega - in ground - delete | -11 | EA | 791.00 | -8,701 |
| Sl4 - ext. pak - delete | -6 | EA | 616.00 | -3,696 |
| J WP - wall back box -WP- delete | -6 | EA | 43.00 | -258 |
| SL3 - poulson (bollard ) - delete | -18 | EA | 1,812.00 | -32,616 |
| PVC-1"C-3#8 - delete | -1,080 | EA | 3.99 | -4,309 |
| Bollard base setups - delete | -18 | EA | 122.00 | -2,196 |
| SL10 - in grade tree ltg - add | 12 | EA | 816.00 | 9,792 |
| Exist. ltg pole to demo - delete | -4 | EA | 576.00 | -2,304 |
| SL1 - 20' pole - delete | -10 | EA | 2,676.00 | -26,760 |
| SL1A - 20' pole - delete | -4 | EA | 2,676.00 | -10,704 |
| SL3 - wall mtd area lt- delete | -4 | EA | 616.00 | -2,464 |
| MC-12/2 - fished - delete | -540 | EA | 1.99 | -1,077 |
| 8"x8"x4" interior j.box - delete | -3 | EA | 74.00 | -222 |
| T/C - 7 day w/batt pak - delete | -1 | EA | 666.00 | -666 |
| Penetrate M bay gym - delete | -1 | EA | 338.00 | -338 |
| PVC-1"C-3#8 - delete | -1,400 | EA | 3.99 | -5,586 |
| Pole base anchor bolts - delete | -14 | EA | 54.00 | -756 |
| Pole base grounding - delete | -14 | EA | 162.00 | -2,268 |
| Pole base sleeves & 90 degs - delete | -14 | EA | 137.00 | -1,918 |
| Add Site Elect | | | | |
| SL1 | 12 | EA | 3,500.00 | 42,000 |
| SL S | 7 | EA | 1,500.00 | 10,500 |
| Site - 90% CD Adders/Deducts: | | | | |
| Early Site Plan - Phase 1 Dwg | | | | |
| E-PH-1 back in | w package #1 | | | |
| HH handhole for P.V. sys | 3 | EA | 591.00 | 1,773 |
| PVC-4"C w/p.s | 600 | EA | 4.58 | 2,748 |
| PVC-2"C w/p.s | 400 | EA | 2.14 | 856 |
| PVC-2 1/2"C w/p.s | 760 | EA | 3.16 | 2,402 |
| OH&P - 10% | 1 | LS | 26,078.80 | 26,079 |
| | | | | 6,000,049 |

DIVISION 31 - EARTHWORK

310000 EARTHWORK

0

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 311000 SITE PREPARATION & CLEARING | | | | |
| | | | | 0 |
| DIVISION 32 - EXTERIOR IMPROVEMENTS | | | | |
| 321000 PAVEMENT, CURBING & EDGING | | | | |
| Pedestrian Paving: | | | | |
| Site Pavement: | | | | |
| HC tactile paver | w/ site package | | | |
| | | | | 0 |
| 323100 SITE IMPROVEMENTS | | | | |
| Entry Paver: | | | | |
| Plaza Paver | 745 | SF | 28.00 | 20,860 |
| Basketball Court: | | | | |
| Bit pavement | w/ site package | | | |
| Color seal coat | 1,750 | SF | 2.50 | 4,375 |
| 8" Gravel | w/ site package | | | |
| Site Development: | | | | |
| Site Improvements: | | | | |
| Gateway and Bandstand | carried w/ building cost | | | |
| Site Benches: | | | | |
| Precast bench - wood top | 20 | LF | 550.00 | 11,000 |
| Bike loop | 20 | EA | 675.00 | 13,500 |
| 8" Gravel Base | w/ site package | | | |
| Versa loc Block - avg 10' high | 3,000 | SF | 48.00 | 144,000 |
| Filter Fabric | 8,400 | SF | 1.10 | 9,240 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Allowance: | | | | |
| Trash/recycle receptacle | 10 | EA | 2,000.00 | 20,000 |
| Entry sign | | NIC | | |
| Electronic school zone signals | | NIC | | |
| Flag pole w/base | 1 | EA | 7,200.00 | 7,200 |
| Traffic Gate | 1 | EA | 3,500.00 | 3,500 |
| Parking/traffic signage (C-7-5) | | w/ site package | | |
| Site Improvement - Allowance | 1 | SF | 30,000.00 | 30,000 |
| *site bollard carried with misc metals | | | | |
| Basketball hoop | 2 | EA | 4,000.00 | 8,000 |
| | | | | --- |
| | | | | 271,675 |
| 328000 IRRIGATION | | | | |
| Irrigate sod | 41,496 | SF | 2.00 | 82,992 |
| Irrigation System- Repair/Replace | 82,800 | SF | 1.00 | 82,800 |
| | | | | --- |
| | | | | 165,792 |
| 329000 LANDSCAPING | | | | |
| Site Earthwork: | | | | |
| 12" Soil @ plant bed ( 8,122 sf ) | 301 | CY | 62.00 | 18,662 |
| 3" Planting bed mulch | 76 | CY | 60.00 | 4,560 |
| 6" Loam - Lawn ( 288,987 sf ) | 5,351 | CY | 55.00 | 294,305 |
| 8" Loam - Athletic Field ( 260,744 sf ) | 6,431 | CY | 55.00 | 353,705 |
| Credit to amend existing soil | -5,900 | CY | 35.00 | -206,500 |
| Plantings: | | | | |
| Trees: | | | | |
| Sheet L2.0: | | | | |
| AC Shadblow Serviceberry (2.5-3" cal) | 1 | EA | 775.00 | 775 |
| AL Allegheny Serviceberry (2.5-3" cal) | 12 | EA | 775.00 | 9,300 |
| CK American Yellowwood (3-3.5" cal) | 17 | EA | 900.00 | 15,300 |
| FG American Beech (3-3.5" cal) | 11 | EA | 900.00 | 9,900 |
| NS Black Tupelo (3-3.5" cal) | 8 | EA | 900.00 | 7,200 |
| OA Sourwood (2.5-3" cal) | 3 | EA | 775.00 | 2,325 |
| PA London Plane Tree (3-3.5" cal) | 24 | EA | 900.00 | 21,600 |
| QP Pin Oak (3-3.5" cal) | 7 | EA | 900.00 | 6,300 |
| QR Red Oak (3-3.5" cal) | 7 | EA | 900.00 | 6,300 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Sheet L2.1: | | | | |
| AR Red Maple (3-3.5" cal) | 6 | EA | 900.00 | 5,400 |
| CK American Yellowwood (3-3.5" cal) | 7 | EA | 900.00 | 6,300 |
| LT Tulip Tree (3-3.5" cal) | 8 | EA | 900.00 | 7,200 |
| NS Black Tupelo (3-3.5" cal) | 7 | EA | 900.00 | 6,300 |
| Shrubs: | | | | |
| CA Sweet Pepperbush (3.5-4' ht) | 28 | EA | 215.00 | 6,020 |
| HQ Oak Leaf Hydrangea (3-3.5' ht) | 49 | EA | 200.00 | 9,800 |
| HV Witch Hazel (7-8' B&B) | 3 | EA | 450.00 | 1,350 |
| IG Inkberry (4-4.5' ht) | 33 | EA | 265.00 | 8,745 |
| IV Winterberry (2.2.5' ht) | 61 | EA | 185.00 | 11,285 |
| JH Creeping Juniper (15-24" spd) | 68 | EA | 50.00 | 3,400 |
| JV Easter Red Cedar (7-8' ht) | 26 | EA | 450.00 | 11,700 |
| MG Sweetgale (3.5-4' ht) | 38 | EA | 215.00 | 8,170 |
| PF Pink Beauty Potentilla (24" spd) | 22 | EA | 65.00 | 1,430 |
| RA Grow Low Sumac (2-2.5' spd) | 47 | EA | 80.00 | 3,760 |
| RT Staghorn Sumac (3 gal) | 13 | EA | 135.00 | 1,755 |
| VA Lowbush Blueberry (15-24" spd) | 53 | EA | 50.00 | 2,650 |
| VD Arrowwood (4-4.5' ht) | 31 | EA | 265.00 | 8,215 |
| VT Dwarf Cranberry Bush (3-3.5' ht) | 12 | EA | 265.00 | 3,180 |
| Groundcover: | | | | |
| Sheet L2.0: | | | | |
| CP Sweet Fern (1 gal) | 1,436 | EA | 36.00 | 51,696 |
| Sheet L2.1: | | | | |
| CP Sweet Fern (1 gal) | 530 | EA | 36.00 | 19,080 |
| Plant Maintance | 1 | LS | 10,000.00 | 10,000 |
| Sod: | | | | |
| Sod at Amphitheater | 25,334 | SF | 1.10 | 27,867 |
| Sports Field | 25,000 | SF | 1.10 | 27,500 |
| Rake , Seed, Fertilize New Lawns: | | | | |
| Lawn | 119,912 | SF | 0.26 | 31,177 |
| Meadow Mix | 143,741 | SF | 0.28 | 40,247 |
| Pea Stone drip edge | 996 | SF | 12.00 | 11,952 |
| Sports field | 235,744 | SF | 0.30 | 70,723 |
| Stone Dust - mech yard | 500 | SF | 4.00 | 2,000 |
| | | | | 942,635 |

DIVISION 33 - UTILITIES

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 330000 UTILITIES | | | | |
| | | | | 0 |

| | | | |
|---|---|---|---|
| PROJECT: | Fuller Middle School | NO. OF SQ. FT.: | 136,600 |
| LOCATION: | Framingham, MA | COST PER SQ. FT.: | 63.77 |
| CLIENT: | SMMA Architects | | |
| DATE: | 26-Sep-19 | | |

No.: 18020

**EARLY SITE PACKAGE #1**

| SUMMARY | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |
|---|---|---|---|
| **DIVISION 02 - EXISTING CONDITIONS** | | | |
| **DIVISION 31 - EARTHWORK** | | | |
| 310000 EARTHWORK | 5,387,568 | 62% | 39.44 |
| 311000 SITE CLEARING | 756,447 | 9% | 5.54 |
| **DIVISION 32 - EXTERIOR IMPROVEMENTS** | | | |
| 321000 BASES, BALLASTS AND PAVING | 64,350 | 1% | 0.47 |
| 323000 SITE IMPROVEMENTS | 1,487,175 | 17% | 10.89 |
| **DIVISION 33 - UTILITIES** | | | |
| 330000 UTILITIES | 1,015,510 | 12% | 7.43 |
| DIRECT COST | 8,711,049 | 100% | 63.77 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 31 - EARTHWORK | | | | |
| 310000 EARTHWORK | | | | |
| Foundations: | | | | |
| Ground Improvements: | | | | |
| Geopiers | 74,000 | FTP | 10.50 | 777,000 |
| Rigid Inclusion towards RB - 1 and RB - | 1 | LS | 50,000.00 | 50,000 |
| Foundation Earthwork: | | | | |
| Surcharge Bldg Footprint | 1 | LS | 300,000.00 | 300,000 |
| Excavate Footings | 3,000 | CY | 15.00 | 45,000 |
| Backfill Foundation | 1,400 | CY | 15.00 | 21,000 |
| Slab Fill | 2,000 | CY | 28.00 | 56,000 |
| Dewatering | 1 | LS | 25,000.00 | 25,000 |
| Foundation drain (1/S300) | 120 | LF | 38.00 | 4,560 |
| Slab on Grade: | | | | |
| 12" Gravel base - SOG | 2,372 | CY | 34.00 | 80,648 |
| Site Earthwork: | | | | |
| Phase 1/2: | | | | |
| Site Cut | 2,847 | CY | 12.00 | 34,164 |
| Stockpile cut | 2,847 | CY | 10.00 | 28,470 |
| Site Fill - supply | 15,810 | CY | 18.00 | 284,580 |
| Phase 3: | | | | |
| Site Cut | 21,721 | CY | 10.25 | 222,640 |
| Site Fill - reuse mat'l | 21,721 | CY | 11.00 | 238,931 |
| Site Fill - supply | 18,000 | CY | 18.00 | 324,000 |
| Site Rough Grading | 101,781 | SY | 2.30 | 234,096 |
| Layout, Mobilization, Supervision | 1 | LS | 250,000.00 | 250,000 |
| Temp Drainage | | N/A | | |
| Dust Control | 1 | LS | 10,000.00 | 10,000 |
| Street Sweeping | 1 | LS | 10,000.00 | 10,000 |
| Surcharge Ampitheater | 1 | LS | 200,000.00 | 200,000 |
| Soils | 1 | LS | 2,118,778.00 | 2,118,778 |
| Soil Management: | | | | |
| Dispose of contaminated soil - less than F | 2,550 | TONS | 14.00 | 35,700 |
| Dispose of contaminated soil - unlined | 850 | TONS | 40.00 | 34,000 |
| Add New Site Fill | 4,000 | CY | 0.75 | 3,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | 5,387,568 |

311000 SITE CLEARING

| | | | | |
|---|---|---|---|---|
| Site Preparation: | | | | |
| Phase One: | | | | |
| Jersey barriers | 1,533 | LF | 75.00 | 114,975 |
| Temp pavement | 98,683 | SF | 1.50 | 148,025 |
| Phase 1 - Grading & Drainage | | | | |
| Erosion control | 701 | LF | 7.50 | 5,258 |
| Site prep | 101,316 | SF | 0.20 | 20,263 |
| Phase 2 - Grading & Drainage: | | | | |
| Temp erosion basin Eroison control | 307 | LF | 15.00 | 4,605 |
| Construction entrance | 1 | EA | 7,500.00 | 7,500 |
| Construction fence | 3,200 | LF | 12.00 | 38,400 |
| Erosion control | 2,500 | LF | 6.00 | 15,000 |
| Drain inlet protection | 25 | EA | 50.00 | 1,250 |
| Erosion control maintenance | 1 | LS | 15,000.00 | 15,000 |
| Strip & stack top soil - 6" | 5,900 | CY | 9.25 | 54,575 |
| Selective Clear and Grub | 1 | LS | 20,000.00 | 20,000 |
| Saw cut walk | 25 | LF | 5.00 | 125 |
| Saw cut drive | 25 | LF | 5.00 | 125 |
| Site - Remove Existing: | | | | |
| Cut and Cap | 1 | LS | 5,000.00 | 5,000 |
| Sanitary and Drain pipe | 1,435 | LF | 35.00 | 50,225 |
| Water Line | 900 | LF | 31.00 | 27,900 |
| Utility structures | 10 | EA | 425.00 | 4,250 |
| Wood guardrail | 300 | LF | 15.00 | 4,500 |
| Bit walk | 201,786 | SF | 0.85 | 171,518 |
| Conc. walk | 14,967 | SF | 1.00 | 14,967 |
| Bit Walkway | 8,874 | SF | 0.90 | 7,987 |
| Misc. site demolition | 1 | LS | 25,000.00 | 25,000 |
| | | | | 756,447 |

DIVISION 32 - EXTERIOR IMPROVEMENTS

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 321000 BASES, BALLASTS AND PAVING | | | | |
| Pedestrian Paving: | | | | |
| Bit sidewalk | 1,862 | SY | 27.00 | 50,274 |
| 8" Gravel Base | 414 | CY | 34.00 | 14,076 |
| | | | | 64,350 |
| 323000 SITE IMPROVEMENTS | | | | |
| Roadways: | | | | |
| Phase 1: | | | | |
| Bit pavement - parking and drive | 8,147 | SY | 27.50 | 224,043 |
| Raised Road Pavement w/ stamped finish | 10,500 | SF | 15.00 | 157,500 |
| 12" Gravel base | 2,715 | SY | 32.00 | 86,880 |
| PCC- RAD | 320 | LF | 32.00 | 10,240 |
| PCC - straight | 1,130 | LF | 26.00 | 29,380 |
| SGC - straight | 189 | LF | 39.50 | 7,466 |
| VGC - RAD | 79 | LF | 46.00 | 3,634 |
| VGC - straight | 365 | LF | 42.00 | 15,330 |
| Line Painting | 1 | LS | 5,000.00 | 5,000 |
| Phase 2: | | | | |
| Bit pavement | 182 | SF | 30.00 | 5,460 |
| 12" Gravel base | 61 | SY | 35.00 | 2,135 |
| Base: | | | | |
| Bit firelane pavement | 1,685 | SY | 27.00 | 45,495 |
| Bit pavement | 14,204 | SY | 27.00 | 383,508 |
| 12" Gravel base | 5,296 | CY | 32.00 | 169,472 |
| VGC radial | 1,646 | LF | 46.00 | 75,716 |
| VGC straight | 2,297 | LF | 42.00 | 96,474 |
| Line Painting | 1 | LS | 7,500.00 | 7,500 |
| Street Patch at New Curb | 1,154 | LF | 50.00 | 57,700 |
| Pavement patch @ utilities | 1 | LS | 15,000.00 | 15,000 |
| Site Development: | | | | |
| Site Improvements | 1 | LS | 13,713.00 | 13,713 |
| Vehicular guardrail - wood | 952 | LF | 65.00 | 61,880 |
| Utility Bollard | 13 | EA | 1,050.00 | 13,650 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | --- |
| | | | | 1,487,175 |
| DIVISION 33 - UTILITIES | | | | |
| 330000 UTILITIES | | | | |
| Water: | | | | |
| Phase 1 - Grading & Drainage | | | | |
| 2" Water | 21 | LF | 70.00 | 1,470 |
| 6" Water | 168 | LF | 92.00 | 15,456 |
| CTE water | 5 | EA | 3,000.00 | 15,000 |
| Fire hydrant | 3 | EA | 2,250.00 | 6,750 |
| 6" Gate Valve | 4 | EA | 1,400.00 | 5600 |
| Misc Valves | 4 | EA | 1,400.00 | 5600 |
| Phase 2 - Grading & Drainage: | | | | |
| 2" Water line | 147 | LF | 62.50 | 9,188 |
| 6" Water line | 717 | LF | 88.00 | 63,096 |
| Fire hydrant | 1 | EA | 2,250.00 | 2,250 |
| 6" Gate Valve | 1 | EA | 1,400.00 | 1400 |
| Misc Valves | 2 | EA | 1,400.00 | 2800 |
| Site Connection | 1 | LOC | 7,500.00 | 7,500 |
| Sanitary Sewer: | | | | |
| Phase 2 - Grading & Drainage: | | | | |
| 8" PVC san | 606 | LF | 80.00 | 48,480 |
| Sewer manhole | 3 | EA | 4,100.00 | 12,300 |
| EGI-1 | 1 | EA | 12,500.00 | 12,500 |
| Acid Waste tank | 1 | LS | 15,000.00 | 15,000 |
| Exist. sanitary manhole - site conn. | 1 | EA | 7,500.00 | 7,500 |
| Storm Sewer: | | | | |
| Phase 1 - Grading & Drainage | | | | |
| 12" HDPE | 33 | LF | 76.00 | 2,508 |
| 18" HDPE | 531 | LF | 94.00 | 49,914 |
| 24" HDPE | 63 | LF | 145.00 | 9,135 |
| 30" HDPE | 10 | LF | 210.00 | 2,100 |
| 6" PVC | 45 | LF | 62.50 | 2,813 |
| Catch Basin | 6 | EA | 2,100.00 | 12,600 |
| CTE drainage | 1 | EA | 4,000.00 | 4,000 |
| Cut & patch existing parking lot | 431 | LF | 50.00 | 21,550 |
| Drain man hole | 3 | EA | 4,100.00 | 12,300 |
| Head wall | 1 | LS | 6,500.00 | 6,500 |
| STC 6000 | 1 | EA | 60,000.00 | 60,000 |
| STC 3600 | 1 | EA | 30,000.00 | 30,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| STC 450i | 2 | EA | 11,500.00 | 23,000 |
| Phase 2 - Grading & Drainage: | | | | |
| 12" HDPE | 154 | LF | 76.00 | 11,704 |
| Catch Basin | 2 | EA | 4,100.00 | 8,200 |
| Temp drain line | 282 | LF | 100.00 | 28,200 |
| Phase 3 ( per revised plane 4 /17/19): | | | | |
| 12" HDPE | 262 | LF | 76.00 | 19,912 |
| 15" HDPE | 665 | LF | 84.00 | 55,860 |
| 18" HDPE | 152 | LF | 94.00 | 14,288 |
| 24" HDPE | 305 | LF | 145.00 | 44,225 |
| 30" HDPE | 537 | LF | 182.00 | 97,734 |
| Catch Basin | 10 | EA | 4,100.00 | 41,000 |
| CB Conversion | 1 | EA | 1,200.00 | 1,200 |
| Drain Manhole | 9 | EA | 4,100.00 | 36,900 |
| Head Wall | 1 | EA | 7,500.00 | 7,500 |
| Outfall wier construction | 1 | LS | 5,000.00 | 5,000 |
| Infiltration field | 1,292 | SF | 25.00 | 32,300 |
| Fuel Distribution: | | | | |
| Phase 2 - Grading & Drainage: | | | | |
| Gas trench | 311 | LF | 48.00 | 14,928 |
| Gas Pipe | | By utility | | |
| Service Meter Pad | 1 | EA | 2,500.00 | 2,500 |
| Electrical Distribution: | | | | |
| Light Pole base - 12' Precast | 37 | EA | 1,350.00 | 49,950 |
| Temporary Electrical Service | 1 | LS | 75,800.00 | 75,800 |
| | | | | 1,015,510 |

| | | | |
|---|---|---|---|
| PROJECT: | Fuller Middle School | NO. OF SQ. FT.: | 136,600 |
| LOCATION: | Framingham, MA | COST PER SQ. FT.: | 53.73 |
| CLIENT: | SMMA Architects | | |
| DATE: | 26-Sep-19 | | |

No.: 18020

**EARLY SITE PACKAGE #2**

| SUMMARY | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |
|---|---|---|---|
| **DIVISION 03 - CONCRETE** | | | |
| 033000 CAST IN PLACE CONCRETE | ####### | 46% | 24.48 |
| **DIVISION 05 - METALS** | | | |
| 051000 STRUCTURAL METAL FRAMING | ####### | 54% | 29.06 |
| **DIVISION 07 - THERMAL & MOISTURE PROTECTION** | | | |
| 071000 DAMPPROOFING & WATERPROOFING | 26,170 | 0% | 0.19 |
| DIRECT COST | ####### | 100% | 53.73 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 03 - CONCRETE | | | | |
| 033000 CAST IN PLACE CONCRETE | | | | |
| Foundations: | | | | |
| Column Footing - (F 3 thru F 12 @ 135 ea): | | | | |
| 4000 psi, NW, (incl. placement) | 454 | CY | 205.00 | 93,070 |
| Formwork | 6,300 | SFCA | 9.50 | 59,850 |
| Rebar | 45,400 | LBS | 1.22 | 55,388 |
| **unit cost $458.83* | | | | |
| Perim Wall Footing 1' x 3'/4' ( 1,578 LF ): | | | | |
| 4000 psi, NW, (incl. placement) | 180 | CY | 208.00 | 37,440 |
| Formwork | 3,200 | SFCA | 8.10 | 25,920 |
| Rebar | 9,000 | LBS | 1.22 | 10,980 |
| **unit cost $413.00* | | | | |
| Foundation Wall 16" thick x height varies ( 1,962 lf): | | | | |
| 4000 psi, NW, (incl. placement) | 442 | CY | 215.00 | 95,030 |
| Formwork - 4' or less | 8,808 | SFCA | 14.00 | 123,312 |
| Formwork - 4' Aud/Gym | 4,960 | SFCA | 14.00 | 69,440 |
| Formwork - 15' | 3,120 | SFCA | 20.00 | 62,400 |
| Brick Shelf | 1,962 | LF | 14.50 | 28,449 |
| Reinforcing steel | 66,300 | LBS | 1.22 | 80,886 |
| **unit cost $1,039.63* | | | | |
| Auditorium Interior Foundations - Stage front: | | | | |
| Wall footing | 32 | CY | 350.00 | 11,200 |
| 12" Knee wall | 27 | CY | 850.00 | 22,950 |
| Loading Dock: | | | | |
| Wall footing | | inc. above | | |
| Foundation wall | 36 | CY | 975.00 | 35,100 |
| Misc. Foundations: | | | | |
| CMU Footing - aud/gym | 28 | CY | 385.00 | 10,780 |
| #1 - #5 Grade Beam | 42 | CY | 675.00 | 28,350 |
| 12" Elevator mat | 6 | CY | 650.00 | 3,900 |
| Elev sump pit | 1 | EA | 900.00 | 900 |
| 12" Elevator pit wall -5'D | 7 | CY | 900.00 | 6,300 |
| Interior Mechanical pads - allow | 1 | LS | 5,000.00 | 5,000 |
| Concrete Pilaster | 28 | CY | 1,100.00 | 30,800 |
| Setting Anchor Bolts and Grout | 132 | EA | 310.00 | 40,920 |
| *Includes Section 031000 - 033500 | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Band Shell Foundation: | | | | |
| Wall Footing 1' x 5' | 6 | CY | 800.00 | 4,800 |
| 16" Radial Found wall | 9 | CY | 1,300.00 | 11,700 |
| Slab on Grade: | | | | |
| 5" Slab on Grade - Typ: | | | | |
| 3,500 psi, NW, (incl. placement) | 988 | CY | 228.00 | 225,264 |
| 6x6 W2.9 X W2.9 | 64,048 | SF | 1.80 | 115,286 |
| Control Joint | 4,300 | LF | 2.60 | 11,180 |
| 15 Mil poly vapor barrier (2/A100) | | w/072600 | | |
| Trowel Finish | 64,048 | SF | 2.10 | 134,501 |
| *unit cost $7.59 | | | | |
| Misc. Slabs and Concrete: | | | | |
| Premium Stepped/sloped slab | 3,460 | SF | 8.00 | 27,680 |
| Ext. 5" Loading Dock | 1,125 | SF | 9.00 | 10,125 |
| Ext. Loading Dock Stair Structure | 1 | FLT | 7,500.00 | 7,500 |
| Gyp cement underlayment(spec 035413) | | w/C3020 | | |
| Floor Construction: | | | | |
| 3 1/4" LW Deck fill - typ floor | 68,431 | SF | 9.80 | 670,624 |
| 3 1/4" LW Deck fill - stage plenum (7/A | 570 | SF | 10.00 | 5,700 |
| Roof Construction: | | | | |
| 3 1/4" LW Deck fill : | | | | |
| R 6.25 3" x 18 Ga. Comp Deck- Typ | 3,641 | SF | 8.70 | 31,677 |
| 3 1/4" LW Deck fill : | | | | |
| R 5.5 3" x 18 Ga. Comp Deck- Typ | 29,586 | SF | 8.70 | 257,398 |
| Roof top 1'W x 2'H Concrete Curb @: | | | | |
| Mech RTU unit | 618 | LF | 92.00 | 56,856 |
| Misc Equip curbs | 1 | LS | 9,998.00 | 9,998 |
| Stair Construction: | | | | |
| Conc stair pan fill : | | | | |
| Metal pan stair treads and risers | 1,278 | LFR | 22.00 | 28,116 |
| Metal pan landing | 472 | SF | 18.00 | 8,496 |
| Aud cast stair @ grade (4 flt) | 48 | LFT | 145.00 | 6,960 |
| Floor Finishes: | | | | |
| PC Power Troweled Concrete Floor Finish:: | | | | |
| Auditorium | 3,788 | SF | 5.00 | 18,940 |
| Makerspace ( 1 EA) | 1,972 | SF | 5.00 | 9,860 |
| SITEWORK: | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Pedestrian Paving: | | | | |
| Site Pavement: | | | | |
| Entry Stoop | 200 | SF | 22.00 | 4,400 |
| Concrete sidewalk | 21,127 | SF | 11.00 | 232,397 |
| Plaza Paving | 1,760 | SF | 20.00 | 35,200 |
| Site Development: | | | | |
| Pavilion Amphitheater Step: | | | | |
| Amphitheater stair foundation | 5 | CY | 1,100.00 | 5,500 |
| Amphitheater stair tread (radial) | 385 | LF | 190.00 | 73,150 |
| Ramp and Planter Walls: | | | | |
| Wall Footing | 25 | CY | 475.00 | 11,875 |
| 12" Foundation Wall | 82 | CY | 1,600.00 | 131,200 |
| Ramp Slab | 510 | SF | 15.00 | 7,650 |
| Sandblast finish | 1 | LS | 10,000.00 | 10,000 |
| Site Stair: | | | | |
| Site stair foundation | 38 | CY | 1,100.00 | 41,800 |
| Site stair tread | 251 | LF | 110.00 | 27,610 |
| Main stair tread | 193 | LF | 110.00 | 21,230 |
| Bike Conc Pad | 426 | SF | 25.93 | 11,046 |
| Foundations: | | | | |
| 2" Rigid found. insul w/ 1/2" drain bed - | 1,360 | SF | 6.00 | 8,160 |
| 2" Rigid found. insul - frost wall | 6,884 | SF | 3.20 | 22,029 |
| Slab on Grade: | | | | |
| Stegro vapor barrier (15 mil) | 64,048 | SF | 1.71 | 109,522 |
| | | | | 3,343,795 |

DIVISION 05 - METALS

051000 STRUCTURAL METAL FRAMING

| | | | | |
|---|---|---|---|---|
| Floor Construction: | | | | |
| Wide Flange - beam | 210.52 | TONS | 3,800.00 | 799,976 |
| HSS Beam | 36.2 | TONS | 3,900.00 | 141,180 |
| HSS Brace Frame | 46.7 | TONS | 4,200.00 | 196,140 |
| Wide Flange- Column | 10.7 | TONS | 3,550.00 | 37,985 |
| HSS Column | 88.3 | TONS | 3,900.00 | 344,370 |
| Bolted Ledger Angle | 1.5 | TONS | 3,550.00 | 5,325 |
| Relieving angle (S500) | 1,043 | LF | 185.00 | 192,955 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Wide flange - stage front | 0.5 | TON | 3,700.00 | 1,850 |
| 4" x 4" x 1/8" Bolted angle at found - allc | 250 | LF | 65.00 | 16,250 |
| Hilti bolt conn | 74 | EA | 128.00 | 9,472 |
| Moment Connection | 194 | EA | 1,300.00 | 252,200 |
| Shear stud ( 10/100sf) | 16,200 | EA | 5.25 | 85,050 |
| Atrium coped Beam Detailing #4/S500 | 1 | LS | 49,402.00 | 49,402 |
| Roof Construction: | | | | |
| Wide Flange - beam | 200.8 | TONS | 3,800.00 | 763,040 |
| HSS Beam | 61.0 | TONS | 4,100.00 | 250,100 |
| DLH Bar Joist | 47.84 | TONS | 3,657.00 | 174,951 |
| HD Galv pipe/ HSS Roof Screen | 4.70 | TONS | 5,200.00 | 24,440 |
| HD Galv HSS Entrance Canopy | 2.60 | TONS | 6,000.00 | 15,600 |
| HSS Brace Frame | w/ floor construction | | | |
| Wide Flange- Column | w/ floor construction | | | |
| HSS Column | w/ floor construction | | | |
| Bolted Ledger Angle | 3 | TONS | 3,550.00 | 10,650 |
| Hilti bolt conn | 140 | EA | 128.00 | 17,920 |
| Moment connection | 38 | EA | 750.00 | 28,500 |
| Galv Roof Dunnage: | | | | |
| CH/WF | 9 | TONS | 4,500.00 | 40,500 |
| HSS post | 1 | TONS | 4,500.00 | 4,140 |
| Angle brace | 500 | LBS | 4.00 | 2,000 |
| Site Development: | | | | |
| HD Color Galv HSS/ C Channel Band Sh | 3.40 | TONS | 10,000.00 | 34,000 |
| Floor Construction: | | | | |
| 3" x 18 Ga. Comp Deck- Typ | 68,431 | SF | 3.40 | 232,665 |
| 3" x 18 Ga. Comp Deck- stage | 570 | SF | 3.60 | 2,052 |
| Roof Construction: | | | | |
| R 1.5 1 1/2" x 20Ga Roof deck | 765 | SF | 2.80 | 2,142 |
| R3 3" X 18 Ga. Typical Roof Deck | 13,702 | SF | 3.00 | 41,106 |
| R 6.25 3" x 18 Ga. Comp Deck- Typ | 3,641 | SF | 3.18 | 11,578 |
| R 5.5 3" x 18 Ga. Comp Deck- Typ | 29,586 | SF | 3.18 | 94,083 |
| R 1.5A 1 1/2" Acoustical Roof Deck - gy | 8,835 | SF | 7.25 | 64,054 |
| R3C 3" Roof Deck - aud (acoustical dele | 7,563 | SF | 3.15 | 23,823 |
| | | | | 3,969,500 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 07 - THERMAL & MOISTURE PROTECTION | | | | |
| 071000 DAMPPROOFING & WATERPROOFING | | | | |
| Bid Page #2 Foundation Waterproofing | 1 | LS | 26,170.00 | 26,170 |
| | | | | 26,170 |

| | | | |
|---|---|---|---|
| PROJECT: | Fuller Middle School | NO. OF SQ. FT.: | 136,600 |
| LOCATION: | Framingham, MA | COST PER SQ. FT.: | $324.15 |
| CLIENT: | SMMA Architects | | |
| DATE: | 09-Oct-19 | | |

SUMMARY

No.: 18020

| | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |
|---|---|---|---|
| **DIVISION 02 - EXISTING CONDITIONS** | | | |
| 024117 BUILDING DEMOLITION | 75,000 | 0% | 0.55 |
| 024180 ASBESTOS ABATEMENT | 0 | 0% | 0.00 |
| **DIVISION 03 - CONCRETE** | | | |
| 033000 CAST IN PLACE CONCRETE | 0 | 0% | 0.00 |
| **DIVISION 04 - MASONRY** | | | |
| 042000 UNIT MASONRY* | 2,296,962 | 5% | 16.82 |
| **DIVISION 05 - METALS** | | | |
| 051200 STRUCTURAL STEEL FRAMING | 0 | 0% | 0.00 |
| 053000 METAL DECKING | 0 | 0% | 0.00 |
| 054000 COLD FORMED METAL FRAMING | 0 | 0% | 0.00 |
| 055000 METAL FABRICATIONS* | 1,162,710 | 3% | 8.51 |
| **DIVISION 06 - WOOD, PLASTICS & COMPOSITES** | | | |
| 061000 ROUGH CARPENTRY | 0 | 0% | 0.00 |
| 062000 FINISH CARPENTRY | 2,078,706 | 5% | 15.22 |
| **DIVISION 07 - THERMAL & MOISTURE PROTECTION** | | | |
| 071000 DAMPPROOF., WATERPROOF. & CAULKING* | 761,028 | 2% | 5.57 |
| 070002 ROOFING AND FLASHING* | 1,541,922 | 3% | 11.29 |
| 072100 THERMAL INSULATION | 0 | 0% | 0.00 |
| 072600 VAPOR RETARDERS | 0 | 0% | 0.00 |
| 074214 EXTERIOR WALL PANELS | 1,155,569 | 3% | 8.46 |
| 078100 FIREPROOFING | 381,208 | 1% | 2.79 |
| 078400 FIRESTOPPING | 0 | 0% | 0.00 |
| 079513 EXPANSION JOINTS (NO SPEC) | 40,000 | 0% | 0.29 |

| | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |
|---|---|---|---|
| **DIVISION 08 - OPENINGS** | | | |
| 080001 METAL WINDOWS* | 2,270,752 | 5% | 16.62 |
| 080002 GLASS AND GLAZING* | 882,247 | 2% | 6.46 |
| 081113 HOLLOW METAL DOORS & FRAMES | 136,485 | 0% | 1.00 |
| 081416 FLUSH WOOD DOORS | 159,225 | 0% | 1.17 |
| 083100 ACCESS DOORS AND PANELS | 30,000 | 0% | 0.22 |
| 083323 SPECIAL DOORS | 80,793 | 0% | 0.59 |
| 084513 STRUCT-POLYCARBONATE PNL ASSEMB. & SKYLIG | 14,350 | 0% | 0.11 |
| 087100 DOOR HARDWARE | 366,760 | 1% | 2.68 |
| 089000 LOUVERS & VENTS | 84,000 | 0% | 0.61 |
| **DIVISION 09 - FINISHES** | | | |
| 090003 TILE* | 229,896 | 1% | 1.68 |
| 090006 RESILIENT FLOORING* | 868,464 | 2% | 6.36 |
| 090009 PAINTING* | 547,406 | 1% | 4.01 |
| 092116 GYPSUM WALLBOARD ASSEMBLIES | 5,724,632 | 13% | 41.91 |
| 095100 ACOUSTICAL CEILINGS* | 932,456 | 2% | 6.83 |
| 096446 WOOD & ATHLETIC FLOORING | 225,065 | 1% | 1.65 |
| 096712 RESINOUS FLOORING | 109,314 | 0% | 0.80 |
| 096800 CARPET | 8,456 | 0% | 0.06 |
| 097217 DIGITAL IMAGE WALL COVERINGS | 0 | 0% | 0.00 |
| 097233 DRY-ERASE WALL COVERING | 0 | 0% | 0.00 |
| 097733 SANITARY WALL PANELS | 0 | 0% | 0.00 |
| 098100 ACOUSTICAL INSULATION | 0 | 0% | 0.00 |
| 098400 ACOUSTIC ROOM COMPONENTS | 0 | 0% | 0.00 |
| 098415 WOOD FIBER ACOUSTICAL PANELS | 0 | 0% | 0.00 |
| **DIVISION 10 - SPECIALTIES** | | | |
| 101100 MARKERBOARDS & TACKBOARDS | 180,800 | 0% | 1.32 |
| 101400 SIGNAGE | 68,144 | 0% | 0.50 |
| 102113 TOILET COMPARTMENTS | 55,590 | 0% | 0.41 |
| 102600 WALL AND DOOR PROTECTION | 10,000 | 0% | 0.07 |
| 102813 TOILET ACCESSORIES | 35,127 | 0% | 0.26 |
| 104000 SAFETY SPECIALTIES | 22,800 | 0% | 0.17 |
| 107113 EXTERIOR SUN CONTOL DEVICES | 0 | 0% | 0.00 |
| 109000 MISCELLANEOUS SPECIALTIES | 710,940 | 2% | 5.20 |
| **DIVISION 11 - EQUIPMENT** | | | |
| 113100 RESIDENTIAL APPLIANCES | 10,350 | 0% | 0.08 |
| 114000 FOOD SERVICE EQUIPMENT | 415,270 | 1% | 3.04 |
| 115213 PROJECTION SCREENS | 65,000 | 0% | 0.48 |
| 116143 THEATRICAL EQUIPMENT(No Spec) | 866,921 | 2% | 6.35 |
| 116600 ATHLETIC & SPORTS EQUIPMENT | 102,621 | 0% | 0.75 |
| 119000 MISC. EQUIPMENT | 32,500 | 0% | 0.24 |
| | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |

| | | | |
|---|---|---|---|
| **DIVISION 12 - FURNISHINGS** | | | |
| 122400 WINDOW SHADES | 136,136 | 0% | 1.00 |
| 122414 MOTORIZED WINDOW SHADES | 0 | 0% | 0.00 |
| 123553 CASEWORK | 323,013 | 1% | 2.36 |
| 124813 FLOOR MATS | 7,920 | 0% | 0.06 |
| 124816 ENTRANCE GRILLES & FRAMES | 0 | 0% | 0.00 |
| 126613 TELESCOPING BLEACHERS | 81,250 | 0% | 0.59 |
| 129000 MISCELLANEOUS FURNISHING | 106,445 | 0% | 0.78 |
| **DIVISION 13 - SPECIAL CONSTRUCTION** | | | |
| 130000 SPECIAL CONSTRUCTION | 0 | 0% | 0.00 |
| **DIVISION 14 - CONVEYING EQUIPMENT** | | | |
| 140001 ELEVATORS* | 212,000 | 0% | 1.55 |
| **DIVISION 21 - FIRE SUPPRESSION** | | | |
| 210001 FIRE SUPPRESSION* | 893,565 | 2% | 6.54 |
| **DIVISION 22 - PLUMBING** | | | |
| 220001 PLUMBING* | 2,150,852 | 5% | 15.75 |
| **DIVISION 23 - HVAC** | | | |
| 230001 HVAC* | 8,247,841 | 19% | 60.38 |
| **DIVISION 26 - ELECTRICAL** | | | |
| 260001 ELECTRICAL* | 6,000,049 | 14% | 43.92 |
| **DIVISION 31 - EARTHWORK** | | | |
| 310000 EARTHWORK | 0 | 0% | 0.00 |
| 311000 SITE PREPARATION & CLEARING | 0 | 0% | 0.00 |
| **DIVISION 32 - EXTERIOR IMPROVEMENTS** | | | |
| 321000 PAVEMENT, CURBING & EDGING | 0 | 0% | 0.00 |
| 323100 SITE IMPROVEMENTS | 271,675 | 1% | 1.99 |
| 328000 IRRIGATION | 165,792 | 0% | 1.21 |
| 329000 LANDSCAPING | 942,635 | 2% | 6.90 |
| **DIVISION 33 - UTILITIES** | | | |
| 330000 UTILITIES | 0 | 0% | 0.00 |
| | --- | | |
| DIRECT COST | 44,278,640 | 100% | 324.15 |

*DENOTES FILED SUB-BID

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 02 - EXISTING CONDITIONS | | | | |
| 024117 BUILDING DEMOLITION | SEE SUMMARY | | | |
| Staged Floor at Aud | 1 | LS | 75,000.00 | 75,000 |
| | | | | 75,000 |
| 024180 ASBESTOS ABATEMENT | SEE SUMMARY | | | |
| | | | | 0 |
| DIVISION 03 - CONCRETE | | | | |
| 033000 CAST IN PLACE CONCRETE | SEE BID PACKAGE #2 | | | |
| | | | | 0 |
| DIVISION 04 - MASONRY | | | | |
| 042000 UNIT MASONRY* | | | | |
| Exterior Walls: | | | | |
| Backup : | | | | |
| Gym 12" CMU Back-up - Exposed | 7,497 | SF | 25.50 | 191,174 |
| Aud 12" CMU Back-up - Exposed | 7,342 | SF | 25.50 | 187,221 |
| Int GF finish premium | 7,342 | SF | 5.50 | 40,381 |
| *A462 GF is not noted | | | | |
| Masonry Veneer Building ( QTY Noted): | | | | |
| 4x4x12 Scored brick veneer | 6,252 | SF | 34.00 | 212,568 |
| 4x8x8 Scored brick veneer | 6,722 | SF | 36.00 | 241,992 |
| 4x8x16 Scored ground face CMU | 23,500 | SF | 31.00 | 728,500 |
| 4x4x12 Scored ground face CMU | 3,512 | SF | 33.50 | 117,652 |
| 3" Mineral fiber insul @ masonry | 43,331 | SF | 3.72 | 161,191 |
| A501 Premium: | | | | |
| Sill brick | | w/Unit Cost | | |
| Lip brick | | w/Unit Cost | | |
| Temporary shoring at CMU Bearing | 1 | LS | 100,000.00 | 100,000 |
| SS Masonry flashing | 1 | LS | 35,000.00 | 35,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Staging | | inc. w/ unit | | |
| Precast Concrete: | | | | |
| Misc. BLDG precast veneer | | N/A | | |
| *Site planters are included w/ site improvements | | | | |
| 2nd Floor Main Entry Terrace: | | | | |
| (3/ A316)3'6"H Brick Partial HT wall-com | 26 | LF | 440.00 | 11,440 |
| (3/ A316) Wall Cap | 26 | LF | 175.00 | 4,550 |
| Partitions: | | | | |
| Interior 12" CMU Partition: | | | | |
| Gym - 28' | 4,480 | SF | 29.00 | 129,920 |
| Auditorium - 28' | 2,660 | SF | 29.00 | 77,140 |
| Auditorium - 14' | 420 | SF | 26.00 | 10,920 |
| GF CMU - Aud. Only | 2,660 | SF | 4.50 | 11,970 |
| Acoustical Block - Premium | 1,000 | SF | 6.50 | 6,500 |
| Stage front CMU pier (5 loc) | 22.5 | SF | 55.00 | 1,238 |
| Int GF finish premium | 5,740 | SF | 4.50 | 25,830 |
| CMU Partition (Gym & Aud): | | | | |
| Bond beam | 37 | LF | 48.00 | 1,776 |
| | | | | 2,296,962 |

DIVISION 05 - METALS

051200 STRUCTURAL STEEL FRAMING

SEE BID PACKAGE #2

0

053000 METAL DECKING

SEE BID PACKAGE #2

0

054000 COLD FORMED METAL FRAMING

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| *w/ gypsum drywall | | | | |
| | | | | 0 |
| 055000 METAL FABRICATIONS* | | | | |
| Elevators: | | | | |
| Elev. framing | 1 | EA | 3,000.00 | 3,000 |
| Elev. pit ladder | 1 | EA | 1,537.00 | 1,537 |
| Elev. sump grate | 1 | EA | 1,500.00 | 1,500 |
| Exterior Walls: | | | | |
| 42" Perf Metal Guardrail: | | | | |
| LVL 2 entry | 11 | LF | 350.00 | 3,850 |
| LVL 2 emerg. egress | 42 | LF | 350.00 | 14,700 |
| LVL 2 emerg. egress stair wall rail | 8 | LF | 145.00 | 1,160 |
| Galv, loose lintel (per 5600-604) | 133 | LF | 36.00 | 4,788 |
| Misc metals @ ext wall - allow | 1 | LS | 25,000.00 | 25,000 |
| Reliving angle | | W /Structural | | |
| Bolted galv. sill angle @ fnd | | W /Structural | | |
| Support clip @ skylight curb (spec) | 567 | LF | 125.00 | 70,875 |
| Exterior Doors: | | | | |
| OH door frame @: | | | | |
| Tech-Makerspace | 1 | EA | 500.00 | 500 |
| Special Doors: | | | | |
| LVL 1 Corridor Security Gate- sgl ( 7' x7'1 | 2 | EA | 7,000.00 | 14,000 |
| Partitions: | | | | |
| Folding Panel partition Support (18/A620): | | | | |
| Typ classroom (13 EA) | 208 | LF | w/ pacakge #2 | |
| Music classroom (DBL panel 1 EA) | 19 | LF | w/ pacakge #2 | |
| SPED suite (3 EA) | 120 | LF | w/ pacakge #2 | |
| Folding Grille Support @: | | | | |
| Learning common | 46 | LF | 200.00 | 9,200 |
| Sgl custom security gate (7'w) | 2 | EA | 4,000.00 | 8,000 |
| Coiling Grille Support @: | | | | |
| Servery | 35 | LF | 100.00 | 3,500 |
| Main office(1 EA) | 21 | LF | 100.00 | 2,100 |
| CMU Partition (Gym & Aud): | | | | |
| CMU clip @ 4' oc | 70 | EA | 115.00 | 8,050 |

### 2.3.7 Prequalification Requirements

Electrical Trade Contractors were prequalified for the Early Site Package on May 6, 2019. The listing of the prequalified trade contractors is appended to the end of this section.

Waterproofing, Dampproofing and Caulking Trade Contractors were prequalified for the Early Concrete and Steel Package on August 5, 2019. The listing of the prequalified trade contractors is appended to the end of this section.

Masonry Trade Contractors were prequalified for the Early Masonry Package on September 16, 2019. The listing of the prequalified trade contractors is appended to the end of this section.

The full project trade contractor prequalification process is underway. Statements of Qualification were submitted on October 2, 2019 and are currently being reviewed by the Trade Contractor Prequalification Committee, who will bring their recommendation to the School Building Committee at the November 4, 2019 meeting for approval.

The list of submitted Statements of Qualifications is appended to the end of this section.

SMMA

Project Management

**New Fuller Middle School**
**List of Prequalified Trade Contractors**
**Electrical Work for Early Site Package**
**April 29, 2019**

| Trade | Company |
|---|---|
| Electrical | Annese Electrical |
| Electrical | Brite-Lite Electrical Co. |
| Electrical | Energy Electric Co., Inc. |
| Electrical | Jupiter Electric |
| Electrical | Systems Contracting |
| Electrical | Wayne J. Griffin Electric, Inc. |

1000 Massachusetts Avenue
Cambridge, MA 02138
617.547.5400

www.smma.com

**New Fuller Middle School**
**List of Prequalified Trade Contractors**
**Waterproofing, Dampproofing and Caulking Work**
**for Early Concrete and Steel Package**
**August 6, 2019**

| Trade | Company |
|---|---|
| Waterproofing, Dampproofing and Caulking | Acme Waterproofing Co., Inc. |
| Waterproofing, Dampproofing and Caulking | Beacon Waterproofing & Restoration |
| Waterproofing, Dampproofing and Caulking | Chapman Waterproofing & Caulking |
| Waterproofing, Dampproofing and Caulking | Folan Waterproofing & Construction Co., Inc. |
| Waterproofing, Dampproofing and Caulking | P.J. Spillane Company |
| Waterproofing, Dampproofing and Caulking | Superior Waterproofing & Caulking |
| Waterproofing, Dampproofing and Caulking | The Waterproofing Company |

1000 Massachusetts Avenue
Cambridge, MA 02138
617.547.5400

www.smma.com

SMMA

Project Management

**New Fuller Middle School**
**List of Prequalified Trade Contractors**
**Masonry Work for Early Masonry Package**
**September 10, 2019**

| Trade | Company |
|---|---|
| Masonry | Costa Brothers Masonry |
| Masonry | Empire Masonry Corp. |
| Masonry | Fernandes Masonry |
| Masonry | Lighthouse Masonry |
| Masonry | Marmelo Bros. Construction |
| Masonry | Sullivan and Narey Construction Company, Inc. |

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**New Fuller Middle School**
**List of Trade Contractor Submitted Statements of Qualification**
**100% Construction Documents Package**
**October 2, 2019**

| Trade | Company |
|---|---|
| **MISCELLANEOUS & ORNAMENTAL IRON** | Avid Iron Works<br>EDM Construction<br>North Shore Steel<br>Roman Iron Works, Inc.<br>SMJ Metal Company, Inc.<br>The Berlin Steel Construction Company<br>United Steel Inc.<br>V&G Iron Works, Inc. |
| **WATERPROOFING, DAMPPROOFING & CAULKING** | ACME Waterproofing Co., Inc.<br>Beacon Waterproofing & Restoration Inc.<br>Chapman Waterproofing Company<br>East Coast Air Barrier<br>Folan Waterproofing & Construction Co., Inc.<br>Gleeson Powers, Inc.<br>P.J. Spillane Co., Inc.<br>Superior Caulking & Waterproofing Co., Inc.<br>The Waterproofing Company LLC |
| **ROOFING** | Capeway Roofing Systems, Inc.<br>Feeley McAnespie, Inc.<br>Gibson Roofs, Inc.<br>Greenwood Industries<br>J.D. Rivet & Co., Inc.<br>John F. Shea Co., Inc.<br>Rockwell Roofing, Inc.<br>Silktown Roofing<br>Stanley Roofing Company, Inc<br>Titan Roofing Inc. |
| **METAL WINDOWS** | A & A Window Products, Inc<br>Chandler Architectural Products, Inc.<br>Cherry Hill Glass Co., Inc.<br>GVW, INC<br>Kapiloff's Glass, Inc.<br>Lambrian Construction Corporation<br>Lizotte Glass, Inc.<br>Lockheed Window Corp.<br>R&R Window Contractors Inc |
| **GLASS & GLAZING** | A & A Window Products, Inc<br>Aluminum & Glass Concepts, Inc.<br>Chandler Architectural Products, Inc.<br>Cherry Hill Glass Co., Inc.<br>GVW, INC<br>Kapiloff's Glass, Inc.<br>Lizotte Glass, Inc.<br>Lockheed Window Corp.<br>R&R Window Contractors Inc |

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| Trade | Company |
|---|---|
| **TILE** | Ayotte & King For Tile, Inc.,<br>Capital Carpet & Flooring Specialists, Inc.<br>High Point Interiors, Inc.<br>Joseph Cohn & Son<br>M. Frank Higgins & Co., Inc.<br>Pavilion Floors, Inc. |
| **ACOUSTICAL CEILING** | American Contractors Corp.<br>Central Ceilings, Inc.<br>Conn Acoustics, Inc.<br>H. Carr & Sons, Inc.<br>K & K Acoustical Ceilings Inc.<br>The Cheviot Corporation |
| **RESILIENT FLOORING** | Ayotte & King For Tile, Inc.<br>Capital Carpet & Flooring Specialists, Inc.<br>CJM Services, Inc.<br>M. Frank Higgins & Co., Inc.<br>Pavilion Floors, Inc. |
| **PAINTING** | Bello Painting Co Inc<br>Color Concepts Inc.<br>Dandis Contracting Inc<br>Homer Contracting LLC<br>John W. Egan Co., Inc.<br>King Painting Inc<br>O'Byrne Painting & Contracting Inc.<br>New Generation Painting, Inc. |
| **ELEVATORS** | Eagle Elevator Company<br>Delta Beckwith Elevators |
| **FIRE PROTECTION** | Carlysle Engineering, Inc.<br>City Point Fire Protection<br>Cogswell Sprinkler Co., Inc.<br>Covenant Fire Protection, Inc.<br>Encore Fire Protection<br>Johnson Controls<br>Rustic Fire Protection, Inc.<br>Wolverine Fire Protection Co.<br>Xcel Fire Protection Inc.<br>Yankee Sprinkler Co. |
| **PLUMBING** | Araujo Bros. Plumbing and Heating<br>Charles M. Moran Plumbing & Heating<br>E. Amanti & Sons, Inc.<br>Grasseschi Plumbing & Heating, Inc.<br>Harold Brothers<br>N.B. Kenney Company, Inc.<br>Patrick J. Kennedy & Son, Inc.<br>William F. Lynch Co., Inc. |

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**New Fuller Middle School**
**List of Trade Contractor Submitted Statements of Qualification**
**100% Construction Documents Package**
**October 2, 2019**



| Trade | Company |
|---|---|
| **HVAC** | CAM HVAC & Construction Inc.<br>E. Amanti & Sons, Inc.<br>General Mechanical Contractors, Inc.<br>Harold Brothers<br>J.F. White<br>KMD-Bonner Mechanical<br>N.B. Kenney Company, Inc.<br>Patrick J. Kennedy & Son, Inc.<br>Veterans Development Corporation Inc.<br>William F. Lynch Co., Inc. |
| **ELECTRICAL** | Annese Electrical Services<br>LeVangie Electric Co., Inc.<br>Lynnwell Associates, Inc.<br>Systems Contracting Inc.<br>Wayne J Griffin Electric, Inc. |

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## 6C.3 Designer Deliverables

## 3.1 General Requirements

### 3.1.1 Work Plan

Please reference the attached updated Fuller Middle School Work Plan.

**Fuller Middle School**
**Work Plan**

| Phase | Responsibility | Description of Key Tasks | Deliverable | Submittal Date | Status |
|---|---|---|---|---|---|
| Project Scope and Budget | McPhail | Phase 1 Environmental Report | Forward copy of report to Designer | 9/10/2018 | Complete |
| | McPhail | Geotechnical Site Evaluation | Preliminary Geotechnical Report | 9/10/2018 | Complete |
| | JLA, FPS | Final Design Program | Excel spreadsheet and architect's signature | 9/10/2018 | Complete |
| | Vanasse | Traffic Study | Traffic Study | 9/10/2018 | Complete |
| | RSE,JLA, GGD | Building Description Narratives | Architectural, Sustainable Design, MEP, Fire Protection, Structural, and Technology | 9/10/2018 | Complete |
| | JLA | LEED Scorecard | LEED Scorecard and Potential rating | 9/10/2018 | Complete |
| | JLA GGD | Utility Analysis | Narrative | 9/10/2018 | Complete |
| | JLA, FPS, SMMA | DESE Approval | Plans and Program forwarded to SMMA and WPS Working Group. WPS' Narrative describing SPED Program Spaces | 9/10/2018 | Complete |
| | JLA | Document Updates: Plans, Site Plan, Exterior Elevations, Model Images, Specifications | Plans and Specs to Miyakoda and SMMA for Cost Estimate | 9/10/2018 | Complete |
| | JLA, SMMA | Site Development Plans and Analysis | Schematic Site Plan, and Surveys | 9/10/2018 | Complete |
| | JLA | Specifications | Outline Specifications | 9/10/2018 | Complete |
| | JLA, FPS | Schematic Building Floor Plans | Overall 1/8" Building Floor Plans | 9/10/2018 | Complete |
| | JLA | Schematic Roof Plans | Overall and 1/8" Roof Plans | 9/10/2018 | Complete |
| | JLA | Schematic Exterior Elevations | Overall and 1/8" exterior Elevations | 9/10/2018 | Complete |
| | JLA | Massing Study | Images of Exterior Design | 9/10/2018 | Complete |
| | SMMA | Preliminary Project Cash Flow | MSBA Formatted Cash Flow Projections | 9/10/2018 | Complete |
| | SMMA | Project Schedule | OPM Project Schedule | 9/10/2018 | Complete |
| | Miyakoda | Cost Estimate | Uniformat Detailed Estimate 100% SD | 8/24/2018 | Complete |
| | AM Fogarty | Cost Estimate | Uniformat Detailed Estimate 100% SD | 8/24/2018 | Complete |
| | Miyakoda, SMMA | Reconcile Cost Estimate | Reconciled Cost Estimates | 9/10/2018 | Complete |
| | SMMA | Project Budget Cost | Excel Spreadsheet 3011 | 9/10/2018 | Complete |
| | **SUBMITTALS** | | | | |
| | SMMA | Submit Documents for DESE Review | Cover Letter, Space Summary, Plans | 9/12/2018 | Complete |
| | JLA | Submit Documents for Cost Estimates | Plans and Specifications | 8/7/2018 | Complete |
| | JLA | Submit Documents to SMMA | MSBA Formatted PS&B Submission | 9/10/2018 | Complete |
| | SMMA | Submit Documents to MSBA | Final PS&B Submittal | 9/12/2018 | Complete |

| Phase | Responsibility | Description of Key Tasks | Deliverable | Submittal Date | Status |
|---|---|---|---|---|---|
| | RSE | Geotechnical Site Evaluation | Updated Geotechnical Report | 5/8/2019 | Complete |
| | JLA | Program Comparison Analysis | Letter from Architect outlining differences from PS&B Space Summary Submittal | 5/8/2019 | Complete |

| | | | | | |
|---|---|---|---|---|---|
| **Design Development Documents 100% Site Enabling Package** | JLA | Program Space Summary | Space Summary Document signed by Architect | 5/8/2019 | Complete |
| | CDW | Site Related Code Analysis: Permitting and Zoning | Detailed Review of Framingham's Regulatory Requirements | 5/10/2019 | Complete |
| | SMMA | Updated Schedule | Schedule | 5/8/2019 | Complete |
| | Design Team | Design Development Documents | PDF Files | 5/8/2019 | Complete |
| | Design Team | Design Development Specification | PDF Files | 5/8/2019 | Complete |
| | Miyakoda | Design Development Cost Estimate | Detailed Cost Estimate | 5/8/2019 | Complete |
| | Miyakoda, Fogarty, Consigli | Reconcile Cost Estimate | Reconciled Estimates | 5/8/2019 | Complete |
| | SMMA | Value Engineering Report | VE Report | 5/8/2019 | Complete |
| | **SUBMITTALS** | | | | |
| | Design team | Design Development Documents | Drawings, Specifications, Binder | 5/8/2019 | Complete |
| | Design team | 100% Site Enabling Package | Drawings & Specifications | 5/8/2019 | Complete |
| | SMMA | Submit Documents to MSBA | DD Submittal | 5/10/2019 | Complete |
| | | | | | |

| Phase | Responsibility | Description of Key Tasks | Deliverable | Submittal Date | Status |
|---|---|---|---|---|---|
| **60% Construction Documents 100% Structural Package** | Howe Engineers | Site Related Code Analysis: Permitting | Detailed Review of the Regulatory Requirements | 8/7/2019 | Complete |
| | SMMA /JLA | Approval of Proprietary Items | School Committee Vote | 6/5/2019 | Complete |
| | JLA | Program Comparison Analysis | Letter from Architect outlining differences from PS&B Space Summary Submittal | 8/7/2019 | Complete |
| | JLA | Program Space Summary | Space Summary Document signed by Architect | 8/7/2019 | Complete |
| | JLA | Project Design Compliance | Letter from Architect verifying complianceof design with PS&B | 8/7/2019 | Complete |
| | SMMA | Updated Schedule | Schedule | 8/7/2019 | Complete |
| | Design Team | 60% Construction Documents | PDF Files | 8/7/2019 | Complete |
| | Design Team | 60% Construction Specification | PDF Files | 8/7/2019 | Complete |
| | Miyakoda | 60% Cost Estimate | Detailed Cost Estimate | 7/30/2019 | Complete |
| | Miyakoda, Fogarty, Consigli | Reconcile Cost Estimate | Meeting | 7/30/2019 | Complete |
| | SMMA | Value Engineering Report | VE Report | 8/2/2019 | Complete |
| | **SUBMITTALS** | | | | Complete |
| | Design team | 60% Construction Documents | Drawings, Specifications, Binder | 8/7/2019 | Complete |
| | Design team | 100% Structural Package | Drawings & Specifications | 8/7/2019 | Complete |
| | SMMA | Submit Documents to MSBA | 60% CD Submittal | 8/9/2019 | Complete |
| | | | | | |

| Phase | Responsibility | Description of Key Tasks | Deliverable | Submittal Date | Status |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| 90% and 100% Construction Documents<br>100% Masonry Package | JLA | Program Space Summary | Space Summary Document signed and certified by Architect | 10/18/2019 | Complete |
| | Cx Agent | Cx Review | Review Questions and responses from design team | 10/18/2019 | Complete |
| | JLA, GGD | Building Code and Fire Safety Review | Letter from Architect and Code Review Consultant | 10/18/2019 | Complete |
| | JLA | Utility Certification & Board Approval | Letter from Architect stating review meetings and approvals obtained from City Departments | 10/18/2019 | Complete |
| | JLA | Program Comparison Analysis | Letter from Architect outlining differences from 60% Space Summary Submittal | 10/18/2019 | Complete |
| | KMA | Site and Building ADA MAAB Review | Letter of Compliance from the Accessibility Consultant. Design Team's responses to the detailed Review Document provided by Accessibility Consultant | 10/18/2019 | Complete |
| | JLA | Testings and Permits compliance | Letter from Architect stating all testing and permits have been obtained for the project | 10/18/2019 | Complete |
| | JLA, GGD | Compliance with Energy Code | Com CHECK 3.8.1 2009 IEC Report | 10/18/2019 | Complete |
| | RSE | Structural Design Calculations | Structural Design Calculation Report | 10/18/2019 | Complete |
| | JLA | 90% Construction Documents | Documents available for review by design team and independent estimator | 10/18/2019 | Complete |
| | Design Team | 90% Construction Documents | Bound AutoCAD files | 10/18/2019 | Complete |
| | Design Team | 90% Construction Specification | PDF File of Specification | 10/18/2019 | Complete |
| | JLA RSE | 100% Masonry Package | Drawings & Specifications | 10/18/2019 | Complete |
| | JLA | Interior Materials Color Board | Color Board for FPS review | 10/18/2019 | Complete |
| | Design Team | Designer review responses to the 60% MSBA review comments | Letters of compliance from Design Team | 10/18/2019 | Complete |
| | Miyakoda | Final Designer Cost Estimate | Cost Estimates | 10/4/2019 | Complete |
| | Fogarty | Final OPM Cost Estimate | Cost Estimates | 10/4/2019 | Complete |
| | SMMA | Cost Estimate Comparison Spreadsheet | Cost Estimate Comparison Spreadsheet | 10/4/2019 | Complete |
| | Miyakoda, Fogarty, Consigli | Reconcile Cost Estimate | Meeting | 10/1/2019 | Complete |
| | JLA, SMMA | Independent Structural Peer Review | Letter of compliance to Building Code | 9/30/2019 | Complete |
| | SMMA | Value Engineering Report | VE Report | 10/4/2019 | Complete |
| | **SUBMITTALS** | | | | |
| | Design Team | 90% Construction Documents to MSBA | Drawings & Specifications | 10/18/2019 | Complete |
| | Design Team | 100% Construction Documents to MSBA | Drawings & Specifications | 11/22/2019 | |

### 3.1.2 Basis of Design Narratives

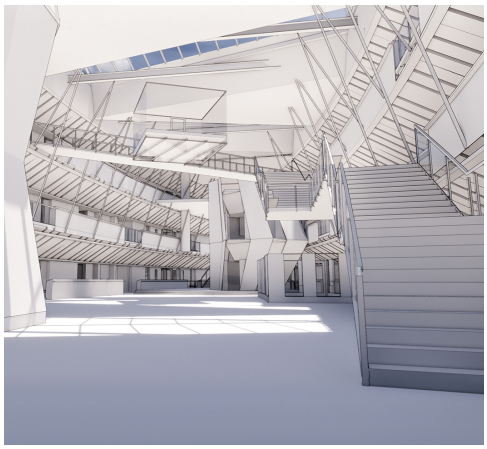
*Architecture*

The new Fuller School's design builds on the District's Educational Program, first and foremost, by embodying the District's stated commitment to a 21st century STEAM, student centered approach to education, a commitment which is already been acted upon through advanced teaching and learning programs at the elementary school level in preparation for this project. STEAM compatible educational environments are achieved through the creation of student driven, problem-based, "hands-on project space" at three different scales within the proposed floor plan. These spaces are provided together with a high degree of visual and functional connectedness both in plan and in section.

The new school will be three-stories, oriented for energy efficiency and sustainability purposes to the south and to the north. The massing utilizes a compact footprint in order to conserve site space and allow for the creation of a sloped campus open space which will unify the District's three buildings in this location into a cohesive educational grouping. The building is located on the open space which now exists as a parking lot between the existing Fuller Middle School footprint to the west Farley School to the east. This location makes it possible to eliminate temporary swing space expenses and minimize disruption to ongoing educational activities by leaving the existing school in operation during the construction phase. Once the new school is complete, the existing 196,000 gsf single story school will be demolished, providing more than 90,000 sf of additional open space than exists today.

The site is organized with vehicular movements removed entirely from the public Flagg Drive. A bus drop-off lane with sufficient queuing space for 17 buses to be parked simultaneously is located directly in front of the school and stretches to the west with a separate exit from the main parking area. Upon demolition of the existing school a new single parking area will be built sufficient in size to accommodate the needs of the school staff and visitors.

The new school floor plan is characterized by two segmented arcs of classrooms facing one another across an open three-story Learning Common atrium. Classroom clusters can be flexibly arranged within the floors or by utilizing monumental stairs, aggregating floors of cohort classrooms. At the center of each one of these cohorts will be located in medium size cohort collaboration space which is co-located with a cohort satellite station area. These medium size collaboration spaces are located on balconies overlooking the main Learning Common and relate visually to one another. Several multi-use breakout spaces are also located on balconies directly adjacent to the classrooms which they serve so as to be highly visible to one another and to the Learning Common. Each cohort cluster also includes at its center a pair of science classrooms.



The school's main entry is at the second floor level, directly adjacent to the administration suite, and leads directly to a balcony overlooking the entire array schools educational program at once. Stairs will branch off from this location either upwards or downwards for ease of communication between floors. Arriving at the lowest ground-floor level Learning Common, one will be surrounded by an array of common shared spaces for the school community including the Media Center, Cafeteria, Maker Space, Music and Art classrooms, Fabrication Lab, Gymnasium and Auditorium. All are arrayed around a single open space will serve as a food court but also as a flexible use whole community collaboration and potential assembly space.

Community use functions will separable from classroom areas through the use of metal mesh partitions. A community entrance is located on the west side of the school, adjacent to the new parking area. The adjacent lobby joining the Gymnasium and the Auditorium will serve these event spaces for the both school and the larger community.

Please reference the attached Basis of Design Narratives:

- Sustainability/ LEED Scorecard
- Fire Protection
- Plumbing System
- HVAC System
- Electrical System
- Technology System

## LEED v4 for BD+C: Schools
Project Checklist

Project Name: Fuller Middle School
Date: 09/17/2019

The Green Engineer
Sustainable Design Consulting

| Y | ? | N | | | |
|---|---|---|---|---|---|
| | | 1 | Credit | Integrative Process | 1 |

| 4 | 1 | 10 | **Location and Transportation** | | **15** |
|---|---|---|---|---|---|
| | | x | Credit | LEED for Neighborhood Development Location | 15 |
| 1 | | | Credit | Sensitive Land Protection | 1 |
| 1 | | 1 | Credit | High Priority Site | 2 |
| 2 | | 3 | Credit | Surrounding Density and Diverse Uses | 5 |
| | | 4 | Credit | Access to Quality Transit | 4 |
| | | 1 | Credit | Bicycle Facilities | 1 |
| | | 1 | Credit | Reduced Parking Footprint | 1 |
| | 1 | | Credit | Green Vehicles | 1 |

| 5 | 2 | 5 | **Sustainable Sites** | | **12** |
|---|---|---|---|---|---|
| Y | | | Prereq | Construction Activity Pollution Prevention | Required |
| Y | | | Prereq | Environmental Site Assessment | Required |
| 1 | | | Credit | Site Assessment | 1 |
| | | 2 | Credit | Site Development - Protect or Restore Habitat | 2 |
| 1 | | | Credit | Open Space | 1 |
| 1 | | 2 | Credit | Rainwater Management | 3 |
| | 2 | | Credit | Heat Island Reduction | 2 |
| 1 | | | Credit | Light Pollution Reduction | 1 |
| | | 1 | Credit | Site Master Plan | 1 |
| 1 | | | Credit | Joint Use of Facilities | 1 |

| 5 | 0 | 7 | **Water Efficiency** | | **12** |
|---|---|---|---|---|---|
| Y | | | Prereq | Outdoor Water Use Reduction | Required |
| Y | | | Prereq | Indoor Water Use Reduction | Required |
| Y | | | Prereq | Building-Level Water Metering | Required |
| 1 | | 1 | Credit | Outdoor Water Use Reduction | 2 |
| 3 | | 4 | Credit | Indoor Water Use Reduction | 7 |
| | | 2 | Credit | Cooling Tower Water Use | 2 |
| 1 | | | Credit | Water Metering | 1 |

| 18 | 8 | 5 | **Energy and Atmosphere** | | **31** |
|---|---|---|---|---|---|
| Y | | | Prereq | Fundamental Commissioning and Verification | Required |
| Y | | | Prereq | Minimum Energy Performance | Required |
| Y | | | Prereq | Building-Level Energy Metering | Required |
| Y | | | Prereq | Fundamental Refrigerant Management | Required |
| 5 | 1 | | Credit | Enhanced Commissioning | 6 |
| 13 | 3 | | Credit | Optimize Energy Performance | 16 |
| | | 1 | Credit | Advanced Energy Metering | 1 |
| | | 2 | Credit | Demand Response | 2 |
| | 1 | 2 | Credit | Renewable Energy Production | 3 |
| | 1 | | Credit | Enhanced Refrigerant Management | 1 |
| | 2 | | Credit | Green Power and Carbon Offsets | 2 |

| 4 | 1 | 8 | **Materials and Resources** | | **13** |
|---|---|---|---|---|---|
| Y | | | Prereq | Storage and Collection of Recyclables | Required |
| Y | | | Prereq | Construction and Demolition Waste Management Planning | Required |
| | | 5 | Credit | Building Life-Cycle Impact Reduction | 5 |
| 1 | | 1 | Credit | Building Product Disclosure and Optimization - Environmental Product Declarations | 2 |
| | 1 | 1 | Credit | Building Product Disclosure and Optimization - Sourcing of Raw Materials | 2 |
| 1 | | 1 | Credit | Building Product Disclosure and Optimization - Material Ingredients | 2 |
| 2 | | | Credit | Construction and Demolition Waste Management | 2 |

| 7 | 7 | 2 | **Indoor Environmental Quality** | | **16** |
|---|---|---|---|---|---|
| Y | | | Prereq | Minimum Indoor Air Quality Performance | Required |
| Y | | | Prereq | Environmental Tobacco Smoke Control | Required |
| Y | | | Prereq | Minimum Acoustic Performance | Required |
| 2 | | | Credit | Enhanced Indoor Air Quality Strategies | 2 |
| 2 | 1 | | Credit | Low-Emitting Materials | 3 |
| 1 | | | Credit | Construction Indoor Air Quality Management Plan | 1 |
| 1 | | 1 | Credit | Indoor Air Quality Assessment | 2 |
| | 1 | | Credit | Thermal Comfort | 1 |
| 1 | 1 | | Credit | Interior Lighting | 2 |
| | 3 | | Credit | Daylight | 3 |
| | 1 | | Credit | Quality Views | 1 |
| | | 1 | Credit | Acoustic Performance | 1 |

| 5 | 1 | 0 | **Innovation** | | **6** |
|---|---|---|---|---|---|
| 4 | 1 | | Credit | Innovation | 5 |
| 1 | | | Credit | LEED Accredited Professional | 1 |

| 1 | 1 | 2 | **Regional Priority** | | **4** |
|---|---|---|---|---|---|
| 1 | | | Credit | Regional Priority: EAc2 Optimize Energy Performance (20%/8 pts) | 1 |
| | 1 | | Credit | Regional Priority: EAc5 Renewable Energy Production (5%/2 pts) | 1 |
| | | 1 | Credit | Regional Priority: LTc4 / LTc5 | 1 |
| | | 1 | Credit | Regional Priority: SSc2 / MRc1 | 1 |

| 49 | 21 | 40 | **TOTALS** | Possible Points: | **110** |
|---|---|---|---|---|---|

**Certified:** 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

## FIRE PROTECTION SYSTEMS

## NARRATIVE REPORT

The following is the Fire Protection system narrative, which defines the scope of work and capacities of the Fire Protection system, as well as, the Basis of Design.

1. CODES

   A. All work installed under Section 21 00 00 shall comply with the MA Building Code, NFPA and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Fire Protection work and all items incidental thereto, including commissioning and testing.

3. GENERAL

   A. In accordance with the provisions of the Massachusetts Building Code, a school building of greater than 12,000s.f. must be protected with an automatic sprinkler system.

4. DESCRIPTION

   A. The new School will be served by new 8-inch fire service, double check valve assembly, and wet alarm valve complete with electric bell, and fire department connection meeting local thread standards.

   B. The system will be a combined standpipe/sprinkler system with control valve assemblies to limit the sprinkler area controlled to less than 52,000 s.f. as required by NFPA 13-2013.

   C. Control valve assemblies shall consist of a supervised shutoff valve, check valve, flow switch and test connection with drain. Standpipes meeting the requirements of NFPA 14-2013 shall be provided in the egress stairwells and in the Stage area.

   D. All areas of the building, including all finished and unfinished spaces, combustible concealed spaces, all electrical rooms, and closets will be sprinkled.

   E. All sprinkler heads will be quick response, concealed pendent in hung ceiling areas and upright in unfinished areas.

   F. Fire department valves and cabinets will be provided on each side of the Stage in the Building.

5. BASIS OF DESIGN

   A. The mechanical rooms, kitchen, science classrooms, and storage rooms are considered Ordinary Hazard Group 1; the stage is considered Ordinary Hazard Group 2; all other areas are considered light hazards.



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Email: ask@akalengineering.com : Web: www.akalengineering.com

B. Required Design Densities:

| | |
|---|---|
| Light Hazard Areas | 0.10 GPM over 1,500 s.f. with 100 gpm hose allowance |
| Ordinary Hazard Group 1 | 0.15 GPM over 1,500 s.f. with 250 gpm hose allowance |
| Ordinary Hazard Group 2 | 0.20 GPM over 1,500 s.f. with 250 gpm hose allowance |

C. Sprinkler spacing (max.):

| | |
|---|---|
| Light Hazard Areas: | 225 s.f. |
| Ordinary Hazard Areas: | 130 s.f. |

D. A hydrant flow test was conducted on October 31, 2018, on Flagg Drive with the following results: 87 PSI static, 78 PSI residual, 1,048 GPM flow, 3,098 GPM flow at 20 PSI. There is adequate water to serve the project without a fire pump.

6. PIPING

A. Sprinkler piping 1-1/2 in. and smaller shall be ASTM A-53, Schedule 40 black steel pipe. Sprinkler/standpipe piping 2 in. and larger shall be ASTM A-135, Schedule 10 black steel pipe.

7. FITTINGS

A. Fittings on fire service piping, 2 in. and larger shall be Victaulic Fire Lock Ductile Iron Fittings conforming to ASTM A-536 with integral grooved shoulder and backstop lugs and grooved ends for use with Style 009-EZ or Style 005 couplings. Branch line fittings shall be welded or shall be Victaulic 920/920N Mechanical Tees. Schedule 10 pipe shall be roll grooved. Schedule 40 pipe, where used with mechanical couplings, shall be roll grooved and shall be threaded were used with screwed fittings. Fittings for threaded piping shall be malleable iron screwed sprinkler fittings.

8. JOINTS

A. Threaded pipe joints shall have an approved thread compound applied on male threads only. Teflon tape shall be used for threads on sprinkler heads. Joints on piping, 2 in. and larger shall be made up with Victaulic, or equal, Fire Lock Style 005, rigid coupling of ductile iron and pressure-responsive gasket system for wet sprinkler system as recommended by manufacturer.

9. FIRE STANDPIPE EQUIPMENT

A. Fire Department Valves shall be 2-1/2 inch valves fitted with 2-1/2 inch x 1-1/2 inch reducer, caps, and chains all conforming to Local Fire Department thread standard. Valves shall be polished chrome plated and shall be mounted in a recessed cabinet.

B. Cabinets for the Fire Department Valves shall be fully recessed, solid door, prime painted steel. Include graphic and door catch.

C. Provide 32 inch x 32 inch access panels at floor control locations or recessed cabinets as appropriate to the wall construction.

10. SPRINKLER SYSTEM EQUIPMENT

A. Double-check valve assembly (Backflow Preventer) shall be UL listed FM approved, complete with test kit and spare parts kit. The Double Check Valve Assembly shall consist



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of two independent tri-link check modules within a single housing, sleeve access port, four test cocks and two drip tight shut-off valves. Tri-link checks shall be removable and serviceable, without the use of special tools. The housing shall be constructed of Schedule 40 stainless steel pipe with grooved end connections. Tri-link checks shall have reversible elastomer discs and in operation shall produce drip tight closure against reverse flow caused by backpressure or backsiphonage. This Sub-contractor shall act as the Owner's agent in seeking approval from the Department of Environmental Protection or its designee.

B. Gate valves, 2 inches and smaller shall be outside screw and yoke, bronze, rising stem, wedge disc type, threaded, conforming to MSS SP-80. Gate valve 2-1/2 inches and larger shall be iron body, bronze trim, outside screw, and yoke, flanged, UL/FM listed conforming to MSS SP-70. All valves shall be UL listed for at least 175 psi working water pressure (wwp).

C. Globe and angle valves may be used as auxiliary valves (drain valves, test valves, trim valves and valves on compressed air piping) for diameters not over 2 in. They shall be bronze, rising stem, with the bronze disc, threaded, conforming to MSS SP-80 Class 150.

D. Check valves shall be swing type except as noted. Valves 2 inches and smaller shall be bronze, regrinding type with the renewable disc, screwed caps, threaded, class 150 conforming to MSS SP-80. Check valves 2-1/2 inches and greater shall be iron body, bronze trim, bolted cover, flanged, conforming to MSS SP-71, UL listed for 175 psi wwp.

E. Wet riser check valves shall be approved vertical type for wet systems, complete with drain valve and glycerin filled pressure gauges. Valve internal components shall be replaceable without removing the valve from the installed position. UL/FM Global approved.

F. Fire Department connection shall be flush mount cast brass two-way inlet body with drop clappers, 2 1/2" x 2 1/2" x 4". Polished brass plate lettered with the approved signage. Two polished brass double female snoots with rigid end NPT x pin lug hose thread swivels, plugs and chain. The connection's lettering and threads shall match Local Fire Department requirements. Confirm finish with Architect prior to ordering.

G. Fire protection test connection shall be polished brass plate with lettering to read "TEST". Polished brass double female snoot with rigid end N.P.T. x pin lug hose thread swivel, pin lug plug and chain.

H. Water Flow Indicators: Vane type water flow detector, rated to 250 psig; designed for horizontal or vertical installation; have 2-SPDT circuit switches to provide isolated alarm and auxiliary contacts, 7 ampere 125 volts AC and 0.25 ampere 24 volts DC; complete with factory-set, field-adjustable retard element to prevent false signals, and tamper-proof cover which sends a signal when cover is removed.

I. Electric Alarm: Electrically operated, red enameled gong with pressure alarm switch.

J. Supervisory Switches: SPST, normally closed contacts, designed to signal valve in other than full open position.

11. SPRINKLERS

A. All sprinklers to be used on this project shall be Quick Response type and shall be stamped with date of manufacture and temperature rating. Temperature ratings shall be determined



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by the location of the heads per NFPA 13-2013, section 8.3.2.5, and shall be minimum 155° F throughout except in special areas around heat-producing equipment, skylights, and attics in which case use temperature rating to conform with hazard as specified in NFPA 13-2013. Orifice diameter and K factor shall be appropriate to meet the hydraulic design criteria, the available water supply, and NFPA Standards.

B. Furnish spare heads of each type installed located in a cabinet along with special sprinkler wrenches. The number of spares and locations of cabinet shall be in complete accord with NFPA 13-2013.

C. Sprinklers shall be manufactured by Tyco, Victaulic, Viking, or equal.

D. Upright sprinkler heads in areas with no ceilings shall be Tyco Model "TY-FRB" Quick Response, upright natural brass finish heads. Include heavy-duty sprinkler guards in all mechanical rooms, storage rooms, and gymnasium. In pool equipment area, all heads shall be stainless steel.

E. Sidewall heads shall be Tyco Model "TY-FRB" Quick Response with white polyester head and escutcheon.

F. Pendent wet sprinkler heads shall be Tyco Model "TY-FRB" Quick Response recessed adjustable escutcheon, white polyester finish.

G. Concealed heads shall be Tyco Model "RFII" Quick Response concealed type, 1-1/2 inch adjustment white cover plate. In special areas, as may be noted on the Drawings, provide alternate cover plate finishes (5 custom colors).



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**PLUMBING SYSTEMS**

**NARRATIVE REPORT**

The following is the Plumbing system narrative, which defines the scope of work and capacities of the Plumbing system as well as the Basis of Design. The Plumbing Systems shall be designed and constructed for ***LEED v4 for Schools*** where indicated in this narrative.

1. CODES

   A. All work installed under Section 22 00 01 shall comply with the MA Building Code, MA Plumbing Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Plumbing work and all items incidental thereto, including commissioning and testing.

3. GENERAL

   A. The Plumbing Systems that will serve the project are cold water, hot water, tempered water, sanitary waste and vent system, grease waste system, special waste system, storm drain system, and natural gas.

   B. The Building will be serviced by Municipal water and Municipal sewer system.

   C. All Plumbing in the building will conform to Accessibility Codes and to Water Conserving sections of the Plumbing Code.

4. DRAINAGE SYSTEM

   A. Soil, Waste, and Vent piping system is provided to connect to all fixtures and equipment. The system runs from 10 feet outside the building and terminates with stack vents through the roof.

   B. A separate Grease Waste System starting with a connection to an exterior concrete grease interceptor running the kitchen area fixtures. Chamber vent for outdoor grease interceptor and vent terminal through the roof. The point of use grease interceptors is to be provided at designated kitchen fixtures. The exterior grease interceptor shall be provided under Division 22 scope.

   C. The storm Drainage system is provided to drain all roofs with roof drains piped through the building to a point 10 feet outside the building.



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D. Drainage system piping will be service weight cast iron piping; hub and spigot with gaskets for below-grade; no hub with gaskets, bands, and clamps for above grade 2 in. and larger. Waste and vent piping 1-1/2 in. and smaller will be type 'L' copper.

E. A separate Special Waste System shall be provided starting with a connection to a limestone chip acid neutralizer tank and shall collect science classroom fixtures. The tank vent and fixture acid vent terminals through the roof. Special Waste and Vent piping will be Schedule 40 electric heat-fused polypropylene piping, fittings and traps, flame retardant above grade and non-flame retardant below ground.

5. WATER SYSTEM

A. A new 4-inch domestic water service from the municipal water system will be provided. A meter and backflow preventer is provided.

B. Domestic cold water distribution main is provided. Non-freeze wall hydrants with integral back flow preventers are provided along the exterior of the building.

C. Domestic hot water heating will be provided with a combination of gas-fired, high efficiency, condensing water heater (Two 400 MBH input), with a separate storage tank (300 gallon). The system is to be equipped with thermostatically controlled mixing devices to control water temperature to the fixtures.

D. A pump will re-circulate hot water from the piping system. The water temperature will be 120 deg. to serve general use fixtures. A 140 deg. F hot water will be supplied to the kitchen dishwasher.

E. Water piping will be type 'L' copper with copper sweat fittings, silver solder or press-fit system. All piping will be insulated with 1 in. thick high-density fiberglass.

F. A dedicated non-potable cold and hot water system will be provided to Science Classrooms. The water system will be protected with a reduced pressure backflow preventer. Self- regulating heat tracing will be provided at lab/ hot water for temperature maintenance.

G. Tepid (70 deg. F – 90 deg. F) water will be provided to the emergency shower/eyewash fixtures in Science Classrooms as required by code.

6. GAS SYSTEM

A. Natural gas service will be provided for the building and will serve the boilers, domestic water heaters, kitchen cooking equipment, science classroom and emergency generator.

B. Science classrooms requiring gas turrets will be provided with gas with master gas control shut off valve.

C. Gas piping will be Schedule 40 black steel pipe with threaded gas pattern malleable fittings for 2 in. and under and butt welded fittings for 2-1/2 in. and larger.



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7. FIXTURES ***LEED v4***

A. Furnish and install all fixtures, including supports, connections, fittings, and any incidentals to make a complete installation.

B. Fixtures shall be the manufacturer's guaranteed label trademark indicating first quality. All acid-resisting enameled ware shall bear the manufacturer's symbol signifying acid-resisting material.

C. Vitreous china and acid-resisting enameled fixtures, including stops, supplies, and traps shall be of one manufacturer by Kohler, American Standard, or Sloan, or equal. Supports shall be Zurn, Smith, Josam, or equal. All fixtures shall be white. Faucets shall be Speakman, Chicago, or equal.

A. Fixtures shall be as scheduled on drawings.

a. Water Closet: High-efficiency toilet, 1.28 gallon per flush, wall hung, vitreous china, siphon jet. Manually operated 1.28 gallons per flush-flush valve.

b. Urinal: High efficiency 0.13 gallon per flush urinal, wall hung, vitreous china. Manually operated 0.13 gallons per flush-flush valve.

c. Lavatory: Wall-hung / countertop ADA lavatory with 0.35 GPM metering mixing faucet programmed for 10 seconds run-time cycle.

d. Sink: ADA stainless steel countertop sink with gooseneck faucet and 0.5 GPM aerator.

e. Drinking Fountain: Barrier-free hi-low wall mounted electric water cooler, stainless steel basin with bottle filling stations.

f. Janitor Sink: 24 x 24 x 10 Terrazo mop receptor Stern-Williams or equal.

g. Laboratory Sinks: Faucets with vacuum breakers and 0.74 GPM aerators.
h. Emergency Shower/Eyewash: Recessed barrier-free eyewash and shower safety station with ceiling mounted exposed shower and "in-wall" drop-down eyewash with drain pan.

8. DRAINS

A. Drains are cast iron, caulked outlets, nickaloy strainers, and in waterproofed areas and roofs shall have galvanized iron clamping rings with 6 lb. lead flashings to bond 9 in. in all directions. Drains shall be Smith, Zurn, Josam, or equal.

9. VALVES

A. Locate all valves so as to isolate all parts of the system. Shutoff valves 3 in. and smaller shall be ball valves, solder end or screwed, Apollo, or equal.



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10. INSULATION

A. All water piping shall be insulated with snap-on fiberglass insulation Type ASJ-SSL, equal to Johns Manville Micro-Lok HP.

11. CLEANOUTS

A. Cleanouts shall be full size up to 4 in. threaded bronze plugs located as indicated on the drawings and/or where required in soil and waste pipes.

B. Cleanouts for Special Waste System shall be Zurn #Z9A-C04 polypropylene cleanout plug with Zurn #ZANB-1463-VP nickel bronze scoriated floor access cover.

12. ACCESS DOORS

A. Furnish access doors for access to all concealed parts of the plumbing system that require accessibility. Coordinate types and locations with the Architect.

13. WATER HEATER

A. Two gas-fired, high efficiency, condensing water heaters (400,MBH input each) with separate storage tank (300 gallon).

14. GREASE INTERCEPTOR

A. The kitchen Grease Waste System shall be a completely separate system beginning at the exterior grease interceptor through the kitchen and vented individually through the roof. No soil lines will be connected to the grease waste nor sanitary vents to the grease vent. Furnish and install the cast iron tees and associated piping within the grease trap including the 5-foot length on the outlet. All the piping within the grease trap shall be made up with caulked and leaded joints. Install an exterior cleanout as detailed at the point where the line leaves the kitchen area. A grease trap is furnished and set in place including manhole access covers by the Plumbing Contractor.

15. OIL / GAS INTERCEPTOR

A. The Oil/Sand Trap shall be installed in accordance to Massachusetts Plumbing Code 248 CMR 10.22. Fig. 15.



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## HVAC SYSTEMS

## NARRATIVE REPORT

The following is the HVAC Systems narrative, which defines the scope of work and capacities of the HVAC systems, as well as, the Basis of Design for the proposed Middle School.

1. CODES

All work installed under Division 230000 shall comply with the Massachusetts State Building Code, IMC 2015, IECC 2015, and all local, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

The work of Division 230000 is described within the narrative report. The HVAC project scope of work shall consist of providing new HVAC equipment and systems as described here within. All new work shall consist of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Heating, Ventilating and Air Conditioning work and all items incidental thereto, including commissioning and testing.

3. BASIS OF DESIGN

Project weather and Code temperature values are listed herein based on weather data values as determined from ASHRAE weather data tables and the International Energy Conservation Code.

Outside: Winter 5 deg. F, Summer 88 deg. F DB 73 deg. F WB

Inside: 70 deg. F +/- 2 deg. F for heating, 75 deg. F +/- 2 deg. F (50% +/- 5%RH) for cooling for [classroom, administration, auditorium, cafeteria and gymnasium] areas with full air conditioning. 80 deg. F +/- 2 deg. F (55% RH) for cooling for locker and kitchen areas with partial air conditioning/dehumidification ventilation. Unoccupied temperature setback will be provided at 60 deg. F (adj.) for heating and 80 deg. F. (adj.) for cooling.

**O**utside air is provided at the rate of a minimum of 15 cfm/person in all classrooms and large group spaces, and minimum of 15 cfm/person for the Auditorium, Gymnasium and Cafeteria areas. In all cases ASHRAE guide 62.1-2016 and the International Mechanical Code will be met as a minimum. All occupied areas will be designed to maintain 800 PPM carbon dioxide maximum.

The building HVAC system shall be designed as a high efficiency HVAC system that shall meet the related HVAC system requirements of LEED for Schools v4, with a minimum goal of Silver level certification.

4. SYSTEM DESCRIPTION

A. Central Heating Plant:

Heating for the entire building will be through the use of a high efficiency gas-fired condensing Boiler Plant.

The Boiler Plant shall be provided with (2) 4,000 MBH input/3,844 MBH output boilers and (2) end suction base mounted pumps with a capacity of 790 GPM each which will be located in the ground level mechanical room. In addition to new boilers and pumps, new hot water accessories including air separators and expansion tanks shall be provided.

The Boiler Plant will supply heating hot water to heating equipment and systems located throughout the building through a two-pipe fiberglass insulated schedule 40 black steel piping system. The Boiler Plants shall supply a maximum hot water temperature of 160 deg F on a design heating day and the hot water supply water temperature will be adjusted downward based on an outside temperature reset schedule to improve the overall operating efficiency of the power plants. Primary and standby end suction base mounted pumps will be provided with variable frequency drives for variable volume flow through the water distribution system for improved energy efficiency.

Combustion air for each boiler will be directly ducted to each boiler through a galvanized ductwork distribution system. Venting from each boiler shall be through separate double wall aluminized stainless steel (AL29-4C) vent system and shall discharge approximately 12 feet above the roof level. Final venting height will be dependent on the location of building intake air locations and adjacent roofs.

B. Central Cooling Plant:

Chilled water cooling for the majority of the building will be through the use of a high efficiency air cooled chiller plant.

The chiller plant shall be provided with (1) high efficiency modular 4 compressors at 92.5 tons each design oil-less magnetic compressor air cooled design chillers and (2) chilled water end suction base mounted pumps with VFD drives. The chillers will be mounted on the roof and the pumps and chilled water accessories will be located in nearby factory fabricated rooftop mechanical equipment enclosure. In addition to new boilers and pumps, new chilled water accessories including air separators, expansion tanks and buffer tank shall be provided.

The chiller plant will supply chilled water to air conditioning air handling unit equipment located throughout the building through a two-pipe fiberglass insulated schedule 40 black steel piping system. Primary and standby end suction base mounted pumps will be provided with variable frequency drives for variable volume flow through the water distribution system for improved energy efficiency.

The chiller plant shall be provided with (1) 369 ton chiller with (4) 92.5 ton modules and (2) chilled water end suction base mounted pumps with a capacity of approximately 800 GPM each. One chiller module is provided for redundancy.

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C. Classroom Heating and Ventilation (General Classrooms, including SPED, Art, Music, Maker Space, Fab Lab, Tech, Learning Commons/Cafeteria, Administration and Media Center areas):
Rooftop air handling units, with roof penthouse service enclosure, supply and return fan with VFDs, static plate type energy recovery section, hot water heating section with modulating capacity control, chilled water cooling coil with modulating capacity control, static plate reheat section, MERV 13 filtration, variable air volume and carbon dioxide demand ventilation controls which will reduce outside air as allowed maintaining a maximum of 800 PPM and will be provided to serve a full air conditioning displacement ventilation system. Supply air will be provided to the space through a galvanized steel supply duct distribution system and shall be connected to VAV (variable air volume) terminal boxes and wall mounted displacement ventilation diffusers located within the classrooms. Return air will be drawn back to the units by ceiling return air registers located within the classroom and will be routed back to the rooftop unit by a galvanized sheetmetal return air ductwork distribution system. Supplemental hot water radiation heating will be provided along exterior walls.

Classrooms with Displacement Ventilation and Full Air Conditioning:

The classroom space temperature would be controlled to 75 deg. F. +/- 2 deg F, based on a design cooling day of 88 deg F db/73 deg f. wb.

The following rooftop air handling equipment will be required to serve the Classroom areas to provide full air conditioning:

Four (4) air handling units with a capacity of 20,000 CFM (63% OA, 51 tons cooling, 840 MBH heating)

D. Gymnasium:

The Gymnasium will be served by a rooftop air handling unit, with roof penthouse service enclosure, supply and return fan with VFDs, static plate type energy recovery section, hot water heating section with modulating capacity control, chilled water cooling coil, static plate reheat section, MERV 13 filtration, and carbon dioxide controls which will reduce outside air as allowed maintaining a maximum of 800 PPM and will be provided to serve a full air conditioning overhead supply distribution system. Supply air will be provided to the space through a combination galvanized steel and Fabric supply duct distribution system. The overhead fabric ductwork shall have integral supply air diffusers. As levels of carbon dioxide drop, generally relating to a reduction in population, the variable frequency drive located in the rooftop unit will modulate to reduce air flow and ventilation while always maintaining a maximum of 800 ppm. Return air will be drawn back to the unit by perforated ductwork return air registers located within the Gymnasium and will be routed back to the rooftop unit by a galvanized sheetmetal return air ductwork distribution system. Supplemental hot water radiation heating will be provided along exterior walls.

The Gymnasium will be served by (1) one rooftop air handling unit that will have a capacity of 15,000 CFM (73% OA, 40 Tons Cooling, 690 MBH Heating).

E. Locker Rooms and PE/Health Offices:

The Locker Rooms and adjacent office areas will be provided with new roof-mounted air handling units, of the 100% outside air design with static plate energy recovery section. The unit will be approximately 2,000 CFM (100% OA) and will include a supply and exhaust fan with VFDs, 112 MBH hot water heating section with modulating capacity control, 6.5-ton chilled water cooling for dehumidification, static plate type energy recovery and reheat sections and MERV 13 filtration.

Supply air ventilation will be provided to each space through new galvanized supply duct which will travel throughout the area to a series of ceiling mounted supply registers. New exhaust air ductwork and air distribution devices shall be installed and shall be routed from the rooms to the new air handling units.

F. Auditorium and Stage:

The Auditorium and Stage will be provided with a new roof-mounted air handling unit, with roof penthouse service enclosure, of the recirculation design capable of providing 100% outside air variable volume fully air conditioned overhead air distribution to the Auditorium and Stage areas. The Auditorium unit will be approximately 12,000 CFM (42% OA) and will include supply and return fans with VFDs, 410 MBH hot water heating section with modulating capacity control, 26 ton cooling coil with modulating capacity control, static plate energy recovery and reheat sections, and MERV 13 filtration.

Supply air ventilation to the Auditorium will be provided to the space through a combination galvanized steel and Fabric supply duct distribution system. The overhead fabric ductwork shall have integral supply air diffusers. In addition, carbon dioxide controls will be installed which will monitor the overall level of carbon dioxide at a threshold level of 800 ppm. As levels drop generally relating to a reduction in population, the air handling unit outside air damper will modulate to reduce air flow and ventilation while always maintaining a maximum of 800 ppm. Return air will be drawn back to the unit by ductwork with return air registers located at lower levels within the space. Supplemental hot water radiation heating will be provided along exterior walls.

G. Administration Area, Guidance Offices and adjacent Lobby/Circulation areas

Spatial heating and air-conditioning for the Administration area and Guidance offices will be served by variable volume air system with perimeter radiant heating panels. The system will be of a recirculation design with CO2 demand ventilation capable of providing 100% outside air (economizer) and variable air volume operation full air conditioning displacement ventilation air distribution.

These areas shall be served by the classroom rooftop air handling units. Supply air ventilation will be provided to each space that will satisfy both building code requirements based on population and spatial heating and air-conditioning for these zones will be provided by a full air conditioning displacement air ventilation system with CO2 demand ventilation controls. Supplemental hot water radiation heating will be provided along exterior walls.

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H. Kitchen:

The Kitchen areas shall be provided with a new Kitchen exhaust air fan and make-up air rooftop unit with hot water heating. The Kitchen will be heated by a roof mounted heating and ventilation make-up air handling unit with hot water heating and chilled water dehumidification (partial cooling).

A variable volume Kitchen exhaust hood control system consisting of Kitchen exhaust stack temperature and smoke density sensors, supply and exhaust fan variable speed drives, and associated controller will be provided by the Kitchen Equipment Vendor. This system installation shall be field installed and coordinated with the ATC and Electrical Contractors.

I. Lobby, Corridor, and Entry Way Heating:

New hot water convectors, cabinet unit heaters and fin tube radiation heating equipment shall be installed to provide heating to these areas. Corridors shall be ventilated from adjacent air handling unit systems.

J. Custodial Support / Mechanical Room / Adjacent Storage Areas:

Custodial support areas will be heated and ventilated by the classroom rooftop air handling units. Storage areas will be heated by hot water radiation heating equipment. Horizontal type unit heaters will heat areas adjacent to the loading dock. All custodial closets will be exhausted by exhaust air fan systems.

K. Utility Areas:

Utility areas will be provided with exhaust air fan systems for ventilation, and will typically be heated with horizontal type ceiling suspended unit heaters.

The Main Electric Rooms and IDF Rooms will be air conditioned by high efficiency ductless AC cooling units.

L. Atrium Smoke Exhaust System

A smoke exhaust and control evacuation system will be provided for the atrium. The system, including all equipment and control components, shall be interlocked to the building fire alarm system and shall be powered by emergency power. The system shall consist of (4) four, 60,000 CFM each roof mounted smoke exhaust duty rated fans, ductwork, dampers and associated controls. The system shall be designed to purge smoke exhaust from the top of the Atrium. Make-up air shall be provided at the lower first and second floor levels through the use of operable doors, louvers, and/or windows with automatic operators that shall also be connected to the smoke control system.

The Atrium smoke control system design shall be modeled and reviewed by a third-party consultant. As part of the third party's design review CFD and fire dynamic modeling shall be performed to determine the proper smoke exhaust system equipment sizing. After the system is installed, the smoke control system operation shall be tested and verified by a third-party consultant to ensure proper system operation.

M. Testing, Adjusting, Balancing & Commissioning:

All new HVAC systems shall be tested, adjusted, balanced and commissioned as part of the project scope.

N. Automatic Temperature Controls – Building Energy Management System:

A new DDC (direct digital control) automatic temperature control (ATC) and building energy management (BEMS) system shall be installed to control and monitor building HVAC systems. The building lighting control system shall also be integrated into the new building energy management system. Energy metering shall be installed to monitor the energy usage of building HVAC systems and utilities (fuel, gas, water). A building energy dashboard system and kiosk shall be provided to display building energy and water usage. The new building energy management system shall be a BACnet open protocol system with Tridium Niagara JACE front end controller.

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## ELECTRICAL SYSTEMS

## NARRATIVE REPORT

The following is the Electrical Systems narrative, which defines the scope of work and capacities of the Power and Lighting systems, as well as, the Basis of Design. The Electrical systems shall be designed and constructed for ***LEED v4*** where indicated on this narrative. This project shall conform to LEED Silver rating.

1. CODES

   All work installed under Section 260000 shall comply with the International Building Code (IBC) as amended by Massachusetts and all local, county, and federal codes, laws, statutes, and authorities having jurisdiction.

2. DESIGN INTENT

   The work of Section 260000 is indicated in this narrative report. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Electrical work and all items incidental thereto, including commissioning and testing.

3. SEQUENCE OF OPERATIONS AND INTERACTIONS

   A. Classroom and Corridor lighting will be controlled via “addressable relays”, which is achieved through programming networked controls. The control of the relays will be by automatic means, such as an occupancy sensor in each classroom. The system will have a BacNet gateway and will be interfaced with the DDC control system for schedule functions. The controllability shall be in conformance with associated LEED credit in indoor environmental quality.

   B. Automatic control of receptacles based on occupancy will be provided for at least 50% of the receptacles installed in private offices, open offices, and computer classrooms. Controlled receptacles will be marked per NEC 406.3 (E).

   C. Exterior lighting will be controlled by photocell “ON” and “scheduled” for “OFF” operation. The parking area lighting will be controlled by “zones” with dimmable capability.

   D. Emergency and Exit lighting will be run through life safety panels to be “ON “during normal power conditions, as well as, power outage conditions. The emergency lighting system will have time control so that lights are “ON” only when building is occupied.

4. DESCRIPTION OF THE SYSTEMS

A. Electrical Distribution System:

1. Service ratings for the building are designed for a connected load of 10 watts/S.F. The service capacity will be sized for 2,500 Amperes with a 100% rated main breaker. The main buss will be sized at 3,000 Amperes and will have an available space provision at the end of the gear to accommodate a future grid connected photovoltaic array. The switchboard will be furnished with a service entrance transient voltage surge protection device (SPD) rated at 240 kA and digital metering unit to monitor voltage, current, power factor, demand KW and with a data communication port for interface with BMS. Main switchboards short circuit rating with a data communication port for interface with BMS. Main switchboards short circuit rating will be coordinated with the Utility Company but it is estimated to be 65 KAIC.

B. Interior Lighting System:

1. Classroom lighting fixtures consist of ceiling mounted indirect LED luminaries with dimming drivers. The fixtures will be pre-wired for dimming control where natural daylight is available and also for multi-level switching. Office lighting fixtures will consist of similar fixtures to classrooms. Offices on the perimeter with windows shall have daylight dimming controls**.**

   In general, lighting power density will be 30 percent less than IECC 2015. The power density reduction relates to ***LEED v4 for Schools.***

2. Lighting levels will be approximately 30 foot candles in classrooms and offices. The daylight dimming footcandle level will be in compliance with ***LEED v4 for Schools.***

3. Gymnasium lighting will be comprised of indirect LED fixtures with dimming drivers. The fixtures will be provided with protective wire guards. The light level will be designed for approximately 50 foot candles.

   Daylight dimming will be provided within 15 feet of skylights or glazing. Daylight dimming controls will be similar in operation to classrooms.

4. Corridor lighting will be comprised of linear indirect lighting using LED light source. The corridor light level will be designed for approximately 15 foot candles. Corridor lighting will be on a schedule through the DDC system control and only “on” during occupied hours. The corridor lighting will have two level control.

5. Auditorium lighting will be cove pendant LED fixtures with DMX dimming drivers. The light levels will be designed for approximately 20 foot candles.

6. Cafeteria lighting will consist of cove mounted LED linear fixtures with dimming drivers.

7. Kitchen and Servery lighting will consist of recessed 2 ft. x 2 ft. lensed gasketed LED panels. Light levels will be approximately 50 foot candles.

8. Library lighting will consist of indirect LED fixtures and dimming drivers. Light levels will be approximately 30 foot candles.

9. Each area will be locally switched and designed for multi-level controls. Each classroom, office space and toilet rooms will have an occupancy sensor to turn lights off when unoccupied. Daylight sensors will be installed in each room where natural light is available for dimming of light fixtures. Corridors will have occupancy sensors for shutdown of lighting, similar to classrooms.

10. The entire school will be controlled with an automatic lighting control system using the DDC control system for schedule programming of lights.

C. Emergency Lighting System:

1. An exterior ground mounted 300 kW natural gas fueled emergency generator with sound attenuated housing will be provided. Light fixtures and LED exit signs will be installed to serve all egress areas such as corridors, intervening spaces, toilets, stairs and exit discharge exterior doors. The administration area lighting will be connected to the emergency generator.

2. The generator will be sized to include life safety systems, legally required systems (smoke evacuation) and optional standby systems including boilers and circulating pumps, communications systems and kitchen refrigeration.

3. Refer to the attached Generator Load Breakdown Dated April 30, 2019.

D. Site Lighting System:

1. Fixtures for area lighting will be pole mounted cut-off ‘LED’ luminaries in the parking area and roadways. The exterior lighting will be connected to the automatic lighting control system for photocell on and timed off operation. The site lighting fixtures will be dark sky compliant. The illumination level is 1.0 fc for parking areas.

2. Building perimeter fixtures will be wall mounted cut-off over exterior doors for exit discharge.

E. Wiring Devices:

1. Each classroom will have a minimum of (2) duplex receptacles per teaching wall and (2) double duplex receptacles on dedicated circuits at classroom computer workstations. The teacher’s workstation will have a double duplex receptacle also on a dedicated circuit.

2. Office areas will generally have (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided.

3. Corridors will have a cleaning receptacle at approximately 25 foot intervals.

4. Exterior weatherproof receptacles will be installed at exterior doors. The outlets will automatically be switched off from schedule.

5. A system of computer grade panelboards with double neutrals and transient voltage surge suppressors will be provided for receptacle circuits.

F. Fire/Mass Notification System:

1. A fire/mass notification system and detection system will be provided with 60 battery back-up. The system will be of the addressable type where each device will be identified at the control panel and remote annunciator by device type and location to facilitate search for origin of alarms. The notification system will be in conformance with NFPA 72 Chapter 24 emergency communications systems.

2. Smoke detectors will be provided in open areas, corridors, stairwells and other egress ways.

3. The sprinkler system will be supervised for water flow and tampering with valves.

4. Speaker/strobes will be provided in egress ways, classrooms, assembly spaces, open areas and other large spaces. Strobe only units will be provided in single toilets and conference rooms.

5. Manual pull stations will be provided at exit discharge doors.

6. The system will be remotely connected to automatically report alarms to fire department via an approved method by the fire department.

G. Addressable Dual Speaker/Strobe Units for Fire and Mass Notification application:

1. One-way Tone/Voice Communication:

a. The evacuation alarm and alert signals shall be capable of being initiated automatically from the fire alarm control panel (FACP) and transmitted to any speaker circuit, selected speaker circuits or all speaker circuits.

b. The alarm signal, alert signal and live and pre-recorded voice announcements shall be capable of manual transmission from the FACP to any speaker circuit, selected speaker circuits or all speaker circuits by manual selection of the associated speaker circuit control switches.

c. Live voice announcements, via the hand-held microphone or patched in external source, by use of speaker control switches, shall take priority over all previously activated alarm inputs. In addition to NFPA 72 requirements, the system shall be capable of priority live voice announcements over subsequent alarm conditions. In no case shall subsequent alarms disrupt emergency live voice announcements. Mass notification activation is the only condition allowed to override the fire alarm event.

d. Addressable Visual Unit (Xenon Strobe) and Visual/Fire/MNS unit:

1) Combination white/amber strobe/MNS units - Provide Truealert Synchronized white strobe (fire)/yellow strobe (MNS event) all in one unit. Unit shall be red with “FIRE” in white lettering. Yellow strobe shall include “ALERT” in white lettering.

2) Provide candela rating indicated on drawings and in accordance with NFPA requirements.

3) Adjacent to all combination visual units shown on drawings provide an addressable speaker

4) Systems that require separate wiring and control modules to support the specified functionality shall be provided at no additional cost.

2. Addressable Textual Notification Appliance (MNS): Textual Notification Appliance is to operate on a compatible Signaling Line Circuit (SLC) and is to provide a high visibility, multi-color LED text message display.

H. Uninterruptible Power Supply (UPS):

1. Two (2) 24 kW, three (3) phase centralized UPS systems will be provided with 8-minute battery back-up.

2. The system will provide conditioned power to sensitive electronic loads, telecommunication systems, bridge over power interruptions of short duration and allow an orderly shutdown of servers, communication systems, etc. during a prolonged power outage.

3. The UPS systems will also be connected to the stand by generator.

I. Lightning Preventor System:

1. Lightning preventer devices will be provided to provide coverage for the entire building.

2. The lightning preventer equipment will include lightning preventers, conductors, conduits, fasteners, connectors, ground rods, etc.

Renewable Energy System Provisions:

1. The base project will include:

a. Electrical provisions will be made for a roof mounted renewable energy system for a grid connected photovoltaic PV system intended to reduce the facilities demand for power.

J. Two-way Communication System:

1. A Two-Way Communications System will be provided at the elevator lobbies that do not have grade access. Area of rescue assistance call boxes will be provided at Elevator Lobbies with no grade access. The call boxes connect to a main panel located adjacent to the Fire Alarm annunciator panel.

K. Distributed Antennae System (DAS):

1. A public safety radio distributed antenna system (DAS) which consists of bi-directional amplifiers (BDA), donor antennas, coverage antennas, coax cable, coax connectors, splitters, combiners and couplers. These devices will be used as part of a system for in-building public safety 2-way radio system communication.

L. Closed-Circuit TV System(CCTV):

1. A Closed-Circuit TV system will consist of computer servers with image software, computer monitors and IP based closed circuit TV cameras. The head end server will be located in the head end (MDF) room and will be rack mounted. The system can be accessed from any PC within the facility or externally via an IP address. Each camera can be viewed independently. The network video recorders (SAN) will record all cameras and store this information for 45 days at 30 images per second (virtual real time).

2. The location of the cameras is generally in corridors and exterior building perimeter. The exterior cameras are 360 degree multi-sensor type.

3. The system will fully integrate with the access control system to allow viewing of events from a single alarm viewer. Camera images and recorded video will be linked to the access system to allow retrieval of video that is associated with an event.

M. Intrusion System:

1. An intrusion system will consist of security panel, keypads, motion detectors and door contacts. The system is addressable which means that each device will be identified when an alarm occurs. The system is designed so that each perimeter classroom with grade access will have dual tech sensors along the exterior wall and corridors, door contacts at each exterior door.

2. The system can be partitioned into several zones. Therefore, it is possible to use the Gym area while the remainder of the school remains alarmed.

3. The system will include a digital transmitter to summons the local police department in the event of an alarm condition

4. The intrusion system will be connected to the automated lighting control system to automatically turn on lighting upon an alarm.

N. Card Access System:

1. A card access system includes a card access controller, door controllers and proximity readers/keypads. Proximity readers will be located at various locations. Each proximity reader will have a distinctive code to identify the user and a log will be kept in memory. The log within the panel can be accessed through a computer.

2. The alarm condition will also initiate real time recording on the integrated CCTV System. The system may be programmed with graphic maps allowing the end-user to quickly identify alarm conditions and lock/unlock doors.

3. The system is modular and may be easily expanded to accommodate any additional devices.

5. TESTING REQUIREMENTS

The Electrical Contractor shall provide testing of the following systems with the Owner and Owner's Representative present:

- Lighting and power panels for correct phase balance.
- Emergency generator.
- Lighting control system (interior and exterior).
- Fire alarm system.
- Security system.
- Lightning preventor system.

Testing reports shall be submitted to the Engineer for review and approval before providing to the Owner.

6. OPERATION MANUALS AND MAINTENANCE MANUALS

When the project is completed, the Electrical Contractor shall provide operation and maintenance manuals to the Owner.

7. RECORD DRAWINGS AND CONTROL DOCUMENTS

When the project is completed, an as-built set of drawings, showing all lighting and power requirements from contract and addendum items, will be provided to the Owner.

8. COMMISSIONING

The project shall be commissioned per Section 018000 of the specifications.

Fuller Middle School
Framingham, MA
J#680 015 00.00
L#60587/Page 8/October 18, 2019

9. SITE UTILITIES

The Electric, Telephone and Cable TV utilities will be underground for each system provided. Existing town network services shall be maintained.

GARCIA • GALUSKA • DESOUSA
Consulting Engineers Inc.

M#66209r
J#680 015 00.00

DATE: April 26, 2019, *Updated April 30, 2019*

MEMO

TO: Elizabeth Bugbee, AIA
Jonathan Levi Architects.

FROM: David M. Pereira

PROJECT: Fuller Middle School
Framingham, MA

SUBJECT: Generator Load Breakdown

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Please be advised of the following:

The generator will be located on the exterior of the building and will be provided with a 10' emissions stack mounted on top of housing and supported from all four corners with Aircraft cable.

A 300kW natural gas fired generator will allow the facility to function as a Warm-up Shelter within the Student Commons during loss of normal power. Kitchen equipment necessary for warming food will be on generator power. (the use of the range and hood is not included). The system will be designed to lock out ATS-OS (optional stand-by loads) which are the loads listed in items B and C in the below load breakdown list. ATS-OS will be locked out when the smoke exhaust fans for the Atrium are initiated. This is done to avoid an oversized generator as when the smoke exhaust fans run the school is required to be evacuated.

The loads will include all required life safety equipment, legally required equipment as well as, optional standby loads and Warm-Up Shelter loads as listed below.

Emergency Generator Load Breakdown List

Load Breakdown for Life Safety Equipment:

A. All Exit Signs and Emergency Lighting in the areas listed below are fed by Life Safety Emergency Power:

1. Corridors
2. Electrical Rooms
3. Gymnasium & Locker Rooms
4. Cafeteria Learning Commons
5. Media Center
6. Lobbies
7. Central Administration Area
8. Custodian Workshop/Office
9. Domestic Water Room
10. Health Suite/Nurses Office
11. Toilets
12. Auditorium & Stage
13. Data Rooms "Head End Room & IDF Closets
14. Kitchen & Servery
15. Exterior Building mounted lights over doors required for egress lighting
16. Pole mounted lights for parking areas used during warm-up shelter occupancy.

TEL 508-998-5700 FAX 508-998-0883 email: info@g-g-d.com

17. Where required by code (egress areas)

Load Breakdown for Optional Standby Equipment:

B. Equipment listed below is fed by Optional Standby Power:
   1. Door Access Controls, Security System, CCTV
   2. Strategically located receptacles in the following areas. These receptacles will be RED in color:
      a. Central Administration
      b. Electric Rooms and Emergency Electric Rooms
      c. Mechanical Rooms
   3. Heating and Ventilation systems:
      a. Boilers, Water Pumps
      b. Building Management System Headend
      c. Cooling unit serving Head End room & IDF rooms
      d. Unit heater serving water service room.
   4. Equipment within the Head End and IDF rooms including:
      a. Paging/Intercom System
      b. Telephone System
      c. Network electronics
      d. Servers
      e. Telephone system
      f. Clock system
   5. Fire alarm system (system also has full battery back-up 15 minutes of alarm, 60 hours standby)
   6. Elevator
   7. Refrigeration Equipment

C. Warm-up Shelter Loads:
   1. Heating and ventilation systems:
      a. One Rooftop unit serving student commons to provide ventilation and heat to Student Commons.
   2. Kitchen equipment necessary to warm food (excluding range and hood).
   3. Strategically located receptacles in the following areas. These receptacles will be RED in color:
      a. Student Commons
      b. Kitchen/Servery

Load Breakdown for Legally Required Standby Power:

D. Equipment listed below is fed by legally required standby power:
   1. Atrium smoke exhaust system.

DMP:jfm

Enc.

Cc: Carlos G. DeSousa, P.E., Garcia, Galuska & DeSousa, Inc.
Christopher M. Garcia, P.E., Garcia, Galuska & DeSousa, Inc.
Jose M. Carreiro, Garcia, Galuska & DeSousa, Inc.

**Generator Sizing Report**

KOHLER Power Systems

# Sizing Report

## Project information

Project name: Fuller Middle School
Customer's name: Jonathan Levi Architects
Customer contact: Elizabeth Bugbee

## Site requirements

| | |
|---|---|
| Voltage: | 277/480 |
| Phase: | 3 |
| Frequency: | 60Hz |
| Alt. Temp. Rise Duty: | 130°C Standby |
| Qty of Gensets: | 1 |
| Fuel type: | Natural gas |
| Country : | United States |

| | |
|---|---|
| Application: | Schools |
| Emissions Requirement: | Stationary emergency (US EPA) |
| Altitude: | 180 Feet |
| Max. Ambient Temp.: | 82 Degrees F |
| Min. Genset Loading : | 25 % |
| Max. Genset Loading : | 100 % |

## Site load requirements summary

| | |
|---|---|
| Running kW: | 269.94 |
| Running kVA: | 307.37 |
| Running P.F.: | 0.88 |

| | |
|---|---|
| Max. Starting kW: | 100.50 in step 2 |
| Max. Starting kVA: | 130.84 in step 2 |

## Generator selection

| | |
|---|---|
| Genset Model: | 300REZXB |
| Engine: | Doosan 18.3L |
| Emission level: | EPA Certified |
| BHP: | 530.00 |
| Displacement: | 1,115.00 |
| RPM: | 1800 |

| | |
|---|---|
| Alternator: | 4M4019 |
| Alternator Leads: | 12 |
| Alt. Starting kVA at 35% V dip: | 1,730.00 |
| Cal Alt Temp rise with site loads: | 80C |
| Excitation System : | PMG |

| | |
|---|---|
| Rated kW : | 300.00 |
| Site Rated kW : | 298.50 |
| UL 2200 Certified | |

## Generator Performance Summary

| | |
|---|---|
| Voltage Dip Limit: | 30.00 % |
| Frequency Dip Limit: | 10.00 % |
| Harmonic Distortion Limit: | 10.00 % |

| | |
|---|---|
| Calculated Voltage Dip: | 4.36 % |
| Calculated Frequency Dip: | 4.19 % |
| Calculated Harmonic Distortion: | 7.72 % |
| Calculated Genset % Loaded: | 90.43 % |

Report prepared by: david pereira



Software version: 1.0029.5.39

Tuesday, April 30, 2019

Report prepared by: david pereira

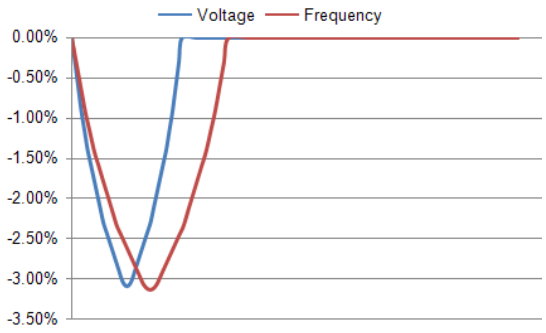
KOHLER Power Systems

# Sizing Report

Model : 300REZXB, Alternator : 4M4019

## Load Profile

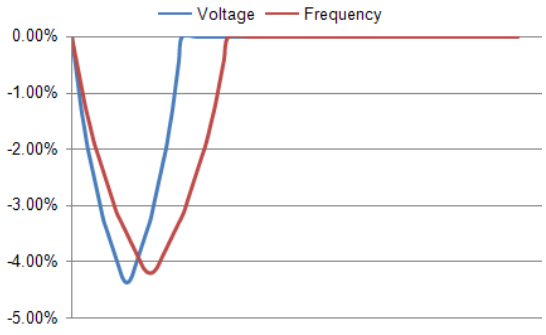
| Step # 1 | Qty | Run | | | Start | | | Volt Dip % | Freq Dip % | Volt. Dist. % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | kW | kVA | PF | kW | kVA | PF | | | |
| **Lighting**<br>**Life Safety Lighting**<br>Evenly distributed<br>LED<br>Filtered Ballast | 1 | 45.00 | 56.25 | 0.80 | 45.00 | 56.25 | 0.80 | | | |
| **Misc. Non-Linear Load**<br>**Data Equipment**<br>3 Phase<br>IGBT | 1 | 14.40 | 16.00 | 0.90 | 24.00 | 26.67 | 0.90 | | | |
| **Misc. Linear Load**<br>**Fire alarm control panel**<br>3 Phase | 1 | 1.20 | 1.20 | 1.00 | 1.20 | 1.20 | 1.00 | | | |
| **Misc. Linear Load**<br>**Hot food well**<br>3 Phase<br>Load Turns On/Off | 1 | 4.00 | 4.00 | 1.00 | 4.00 | 4.00 | 1.00 | | | |
| **Misc. Linear Load**<br>**Hot food well**<br>3 Phase<br>Load Turns On/Off | 1 | 4.00 | 4.00 | 1.00 | 4.00 | 4.00 | 1.00 | | | |
| **Misc. Linear Load**<br>**Disposer**<br>3 Phase<br>Load Turns On/Off | 1 | 2.45 | 2.45 | 1.00 | 2.45 | 2.45 | 1.00 | | | |
| **Step Total** | | 71.05 | 81.89 | 0.87 | 80.65 | 92.54 | 0.87 | 3.08 | 3.13 | 2.18 |
| **Cum.Total** | | 71.05 | 81.89 | 0.87 | | | | | | |




Report prepared by: david pereira

TOTAL SYSTEM INTEGRATION
GENERATORS | TRANSFER SWITCHES | SWITCHGEAR | CONTROLS

| Step # 2 | Qty | Run | | | Start | | | Volt Dip % | Freq Dip % | Volt. Dist. % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | kW | kVA | PF | kW | kVA | PF | | | |
| **Lighting**<br>**Additional shelter lighting**<br>Evenly distributed<br>LED<br>Filtered Ballast | 1 | 50.00 | 62.50 | 0.80 | 50.00 | 62.50 | 0.80 | | | |
| **Air Conditioning**<br>**DCUc-6**<br>Phase B-C<br>solid state current limit | 1 | 1.38 | 1.38 | 1.00 | 2.62 | 4.15 | 0.63 | | | |
| **Air Conditioning**<br>**DCUc-5**<br>Phase A-B<br>solid state current limit | 1 | 1.38 | 1.38 | 1.00 | 2.62 | 4.15 | 0.63 | | | |
| **Air Conditioning**<br>**DCUc-4**<br>Phase A-C<br>autotransformer w 65 | 1 | 1.38 | 1.38 | 1.00 | 3.82 | 6.07 | 0.63 | | | |
| **Air Conditioning**<br>**DCUc-3**<br>Phase A-C<br>solid state current limit | 1 | 1.38 | 1.38 | 1.00 | 2.62 | 4.15 | 0.63 | | | |
| **Air Conditioning**<br>**DCUc-1**<br>Phase A-B<br>solid state current limit | 1 | 3.69 | 3.69 | 1.00 | 6.09 | 11.08 | 0.55 | | | |
| **Office Equipment**<br>**Office equipment**<br>3 Phase | 1 | 4.50 | 5.63 | 0.80 | 4.50 | 5.63 | 0.80 | | | |
| **Air Conditioning**<br>**Walk in cooler**<br>3 Phase<br>soft start with ramp<br>Load Turns On/Off | 1 | 3.33 | 4.50 | 0.74 | 1.25 | 2.16 | 0.58 | | | |
| **Air Conditioning**<br>**Walk in freezer**<br>3 Phase<br>soft start with ramp<br>Load Turns On/Off | 1 | 5.40 | 7.21 | 0.75 | 1.98 | 3.60 | 0.55 | | | |

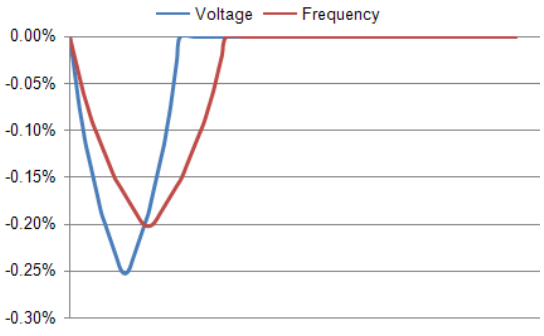



Report prepared by: david pereira

| Step # 2 | Qty | Run | | | Start | | | Volt Dip % | Freq Dip % | Volt. Dist. % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | kW | kVA | PF | kW | kVA | PF | | | |
| **Air Conditioning**<br>**Reach in refrigerator**<br>Phase A-N<br>solid state current limit<br>Load Turns On/Off | 1 | 0.67 | 0.98 | 0.68 | 0.67 | 0.98 | 0.68 | | | |
| **Office Equipment**<br>**kitchen office and POS**<br>3 Phase | 1 | 4.50 | 5.63 | 0.80 | 4.50 | 5.63 | 0.80 | | | |
| **Air Conditioning**<br>**Milk coolers**<br>3 Phase<br>wye delta closed<br>Load Turns On/Off | 2 | 3.48 | 4.90 | 0.71 | 0.99 | 1.62 | 0.61 | | | |
| **Motor**<br>**P-1**<br>20.00 HP<br>3 Phase<br>Motor code : G<br>Loaded<br>NEMA Design<br>VFD<br>Load Turns On/Off | 1 | 18.84 | 20.93 | 0.90 | 18.84 | 20.93 | 0.90 | | | |
| **Step Total** | | 99.95 | 119.42 | 0.84 | 100.50 | 130.84 | 0.77 | 4.36 | 4.19 | 5.60 |
| **Cum.Total** | | 171.00 | 201.23 | 0.85 | | | | | | |

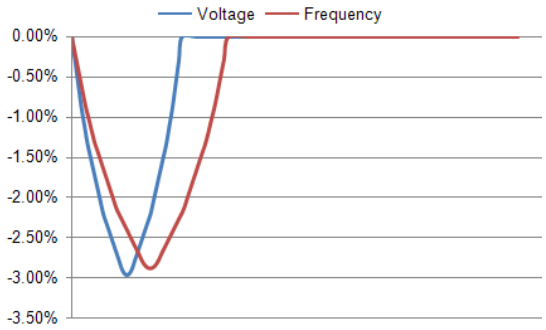
Report prepared by: david pereira

| Step # 3 | Qty | Run | | | Start | | | Volt Dip % | Freq Dip % | Volt. Dist. % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | kW | kVA | PF | kW | kVA | PF | | | |
| **Misc. Linear Load Boiler-3**<br>3 Phase<br>Load Turns On/Off | 1 | 2.34 | 2.34 | 1.00 | 2.34 | 2.34 | 1.00 | | | |
| **Misc. Linear Load Boiler-2**<br>3 Phase<br>Load Turns On/Off | 1 | 2.34 | 2.34 | 1.00 | 2.34 | 2.34 | 1.00 | | | |
| **Air Conditioning DCUc-7**<br>Phase A-C<br>solid state current limit | 1 | 1.38 | 1.38 | 1.00 | 2.62 | 4.15 | 0.63 | | | |
| **Step Total** | | 6.07 | 6.07 | 1.00 | 7.30 | 7.98 | 0.91 | 0.25 | 0.20 | 5.60 |
| **Cum.Total** | | 177.07 | 206.41 | 0.86 | | | | | | |



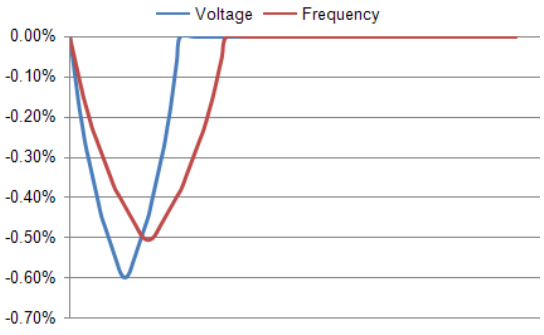

Report prepared by: david pereira

| Step # 4 | Qty | Run | | | Start | | | Volt Dip % | Freq Dip % | Volt. Dist. % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | kW | kVA | PF | kW | kVA | PF | | | |
| **Motor**<br>**RTU-1 supply air**<br>25.00 HP<br>3 Phase<br>Motor code : G<br>Loaded<br>NEMA Design<br>VFD | 2 | 46.83 | 52.03 | 0.90 | 46.83 | 52.03 | 0.90 | | | |
| **Motor**<br>**RTU-1 return air**<br>15.00 HP<br>3 Phase<br>Motor code : G<br>Loaded<br>NEMA Design<br>VFD | 2 | 28.75 | 31.94 | 0.90 | 28.75 | 31.94 | 0.90 | | | |
| **Step Total** | | 75.58 | 83.97 | 0.90 | 75.58 | 83.97 | 0.90 | 2.96 | 2.87 | 7.72 |
| **Cum.Total** | | 252.65 | 290.15 | 0.87 | | | | | | |



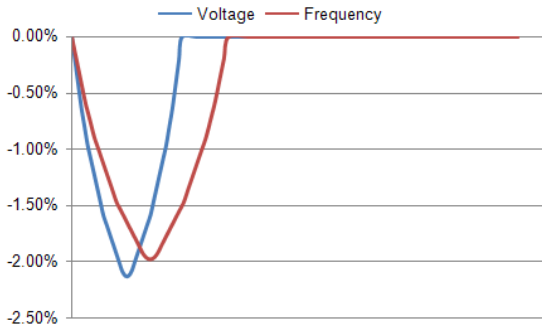

Report prepared by: david pereira

| Step # 6 | Qty | Run | | | Start | | | Volt Dip % | Freq Dip % | Volt. Dist. % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | kW | kVA | PF | kW | kVA | PF | | | |
| Misc. Linear Load Kitchen equipment<br>3 Phase<br>Load Turns On/Off | 4 | 5.76 | 7.21 | 0.80 | 5.76 | 7.21 | 0.80 | | | |
| Misc. Linear Load convection ovens<br>3 Phase<br>Load Turns On/Off | 4 | 11.53 | 11.53 | 1.00 | 11.53 | 11.53 | 1.00 | | | |
| **Step Total** | | 17.29 | 17.82 | 0.97 | 17.29 | 17.82 | 0.97 | 0.60 | 0.50 | 7.72 |
| **Cum.Total** | | 269.94 | 307.37 | 0.88 | | | | | | |




Report prepared by: david pereira

| Loads Turning OFF and ON | Qty | Run | | | Start | | | Volt Dip % | Freq Dip % | Volt. Dist. % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | kW | kVA | PF | kW | kVA | PF | | | |
| **Misc. Linear Load Boiler-3**<br>3 Phase<br>Load Turns On/Off | 1 | 2.34 | 2.34 | 1.00 | 2.34 | 2.34 | 1.00 | | | |
| **Misc. Linear Load Boiler-2**<br>3 Phase<br>Load Turns On/Off | 1 | 2.34 | 2.34 | 1.00 | 2.34 | 2.34 | 1.00 | | | |
| **Air Conditioning Walk in cooler**<br>3 Phase<br>soft start with ramp<br>Load Turns On/Off | 1 | 3.33 | 4.50 | 0.74 | 1.25 | 2.16 | 0.58 | | | |
| **Air Conditioning Walk in freezer**<br>3 Phase<br>soft start with ramp<br>Load Turns On/Off | 1 | 5.40 | 7.21 | 0.75 | 1.98 | 3.60 | 0.55 | | | |
| **Misc. Linear Load Kitchen equipment**<br>3 Phase<br>Load Turns On/Off | 4 | 5.76 | 7.21 | 0.80 | 5.76 | 7.21 | 0.80 | | | |
| **Misc. Linear Load convection ovens**<br>3 Phase<br>Load Turns On/Off | 4 | 11.53 | 11.53 | 1.00 | 11.53 | 11.53 | 1.00 | | | |
| **Air Conditioning Reach in refrigerator**<br>Phase A-N<br>solid state current limit<br>Load Turns On/Off | 1 | 0.67 | 0.98 | 0.68 | 0.67 | 0.98 | 0.68 | | | |
| **Misc. Linear Load Hot food well**<br>3 Phase<br>Load Turns On/Off | 1 | 4.00 | 4.00 | 1.00 | 4.00 | 4.00 | 1.00 | | | |




Report prepared by: david pereira

| Loads Turning OFF and ON | Qty | Run | | | Start | | | Volt Dip % | Freq Dip % | Volt. Dist. % |
|---|---|---|---|---|---|---|---|---|---|---|
| | | kW | kVA | PF | kW | kVA | PF | | | |
| Misc. Linear Load<br>Hot food well<br>3 Phase<br>Load Turns On/Off | 1 | 4.00 | 4.00 | 1.00 | 4.00 | 4.00 | 1.00 | | | |
| Air Conditioning<br>Milk coolers<br>3 Phase<br>wye delta closed<br>Load Turns On/Off | 2 | 3.48 | 4.90 | 0.71 | 0.99 | 1.62 | 0.61 | | | |
| Misc. Linear Load<br>Disposer<br>3 Phase<br>Load Turns On/Off | 1 | 2.45 | 2.45 | 1.00 | 2.45 | 2.45 | 1.00 | | | |
| Motor<br>P-1<br>20.00 HP<br>3 Phase<br>Motor code : G<br>Loaded<br>NEMA Design<br>VFD<br>Load Turns On/Off | 1 | 18.84 | 20.93 | 0.90 | 18.84 | 20.93 | 0.90 | | | |
| **Step Total** | | 64.15 | 69.00 | 0.93 | 56.15 | 59.68 | 0.94 | 2.12 | 1.97 | |
| **Cum.Total** | | 269.94 | 307.37 | 0.88 | | | | | | |
| **Grand Total** | | 269.94 | 307.37 | 0.88 | | | | 4.36 | 4.19 | 7.72 |

Report prepared by: david pereira

**Generator Cut Sheet**

KOHLER®

# Model: 300REZXC

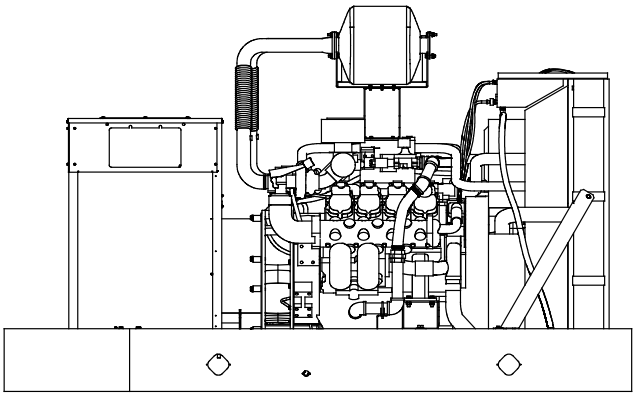
**208- 600 V** **Gas**

ISO 9001 KOHLER® NATIONALLY REGISTERED

***EPA-Certified for Stationary Emergency Applications***

## Ratings Range

| | | 60 Hz |
|---|---|---|
| **Standby:** | **kW** | 230- 300 |
| | **kVA** | 230- 375 |



## Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- The generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- A one-year limited warranty covers all generator set systems and components. Two- and five-year extended limited warranties are also available.
- Alternator features:
  - The unique Fast-Response® II excitation system delivers excellent voltage response and short-circuit capability using a permanent magnet (PM)-excited alternator.
  - The brushless, rotating-field alternator has broadrange reconnectability.

## Generator Set Ratings

| | | | | Rich-Burn Natural Gas 130°C Rise Standby Rating | |
|---|---|---|---|---|---|
| **Alternator** | **Voltage** | **Ph** | **Hz** | **kW/kVA** | **Amps** |
| 4UA13 | 120/208 | 3 | 60 | 300/375 | 1041 |
| 4UA13 | 127/220 | 3 | 60 | 300/375 | 985 |
| 4UA13 | 120/240 | 1 | 60 | 230/230 | 959 |
| 4UA13 | 120/240 | 3 | 60 | 300/375 | 903 |
| 4UA13 | 139/240 | 3 | 60 | 300/375 | 903 |
| 4UA13 | 220/380 | 3 | 60 | 280/350 | 532 |
| 4UA13 | 240/416 | 3 | 60 | 300/375 | 521 |
| 4UA13 | 277/480 | 3 | 60 | 300/375 | 452 |
| 4UA13 | 347/600 | 3 | 60 | 300/375 | 361 |

RATINGS: All three-phase units are rated at 0.8 power factor. *Standby Ratings:* The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO-8528-1 and ISO-3046-1. Obtain technical information bulletin (TIB-101) for ratings guidelines, complete ratings definitions, and site condition derates. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

# Alternator Specifications

| Specifications | Alternator |
|---|---|
| Manufacturer | Kohler |
| Type | 4-Pole, Rotating-Field |
| Exciter type | Brushless, Permanent-Magnet |
| Leads: quantity, type | 12, Reconnectable |
| Voltage regulator | Solid State, Volts/Hz |
| Insulation: | NEMA MG1 |
| Material | Class H |
| Temperature rise | 130°C, Standby |
| Bearing: quantity, type | 1, Sealed |
| Coupling | Flexible Disc |
| Amortisseur windings | Full |
| Voltage regulation, no-load to full-load | Controller Dependent |
| One-step load acceptance | 100% of Rating |
| Unbalanced load capability | 100% of Rated Standby Current |
| Peak motor starting kVA: | (35% dip for voltages below) |
| 480 V 4UA13 | 990 (60Hz) |

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and dripproof construction.
- Windings are vacuum-impregnated with epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
- Fast-Response® II brushless alternator with brushless exciter for excellent load response.

# Application Data

## Engine

| Engine Specifications | |
|---|---|
| Manufacturer | Doosan |
| Engine model | D146L |
| Engine type | 14.6 L, 4-Cycle, Turbocharged, Aftercooled |
| Cylinder arrangement | V-8 |
| Displacement, L (cu. in.) | 14.6 (892) |
| Bore and stroke, mm (in.) | 128 x 142 (5.04 x 5.59) |
| Compression ratio | 10.5:1 |
| Piston speed, m/min. (ft./min.) | 511 (1677) |
| Main bearings: quantity, type | 10, Precision Half-Shell |
| Rated rpm | 1800 |
| Max. power at rated rpm, kWm (BHP) | 342 (459) |
| Cylinder head material | Cast Iron |
| Piston: type, material | — |
| Crankshaft material | Forged Steel |
| Valve material | — |
| Governor: type | Electronic |
| Frequency regulation, no-load to full-load | Isochronous |
| Frequency regulation, steady state | ±0.5% |
| Frequency | Fixed |
| Air cleaner type, all models | Dry |

## Exhaust

| Exhaust System | |
|---|---|
| Exhaust manifold type | Wet |
| Exhaust flow at rated kW, kg/hr. (cfm) | 1308 (1895) |
| Exhaust temperature at rated kW, dry exhaust, °C (°F) | 732 (1350) |
| Maximum allowable back pressure overall, kPa (in. Hg) | 10.2 (3) |
| Maximum allowable back pressure after catalyst, kPa (in. Hg) | 5.1 (1.5) |
| Engine exhaust outlet size, mm (in.) | Flanged Outlet at Catalyst, see ADV drawing |

## Engine Electrical

| Engine Electrical System | |
|---|---|
| Battery charging alternator: | |
| Ground (negative/positive) | Negative |
| Volts (DC) | 24 |
| Ampere rating | 45 |
| Starter motor rated voltage (DC) | 24 |
| Battery, recommended cold cranking amps (CCA): | |
| Qty., CCA rating each | Two, 1000 |
| Battery voltage (DC) | 12 |

## Fuel

| Fuel System - Rich Burn | |
|---|---|
| Fuel type | Natural Gas |
| Fuel supply line inlet | 2.0 NPTF |
| Natural gas fuel supply pressure, kPa (in. $H_2O$) | 1.74- 2.74 (7.0- 11.0) |

Fuel supply pressure, measured at the generator set fuel inlet downstream of any fuel system equipment accessories.

| Fuel Composition Limits * | Nat. Gas |
|---|---|
| Methane, % by volume | 90 min. |
| Ethane, % by volume | 4.0 max. |
| Propane, % by volume | 1.0 max. |
| Propene, % by volume | 0.1 max. |
| $C_4$ and higher, % by volume | 0.3 max. |
| Sulfur, ppm mass | 25 max. |
| Lower heating value, $MJ/m^3$ ($Btu/ft^3$), min. | 33.2 (890) |

* Fuels with other compositions may be acceptable. If your fuel is outside the listed specifications, contact your local distributor for further analysis and advice.

# Application Data

## Lubrication

| Lubricating System | |
|---|---|
| Type | Full Pressure |
| Oil pan capacity, L (qt.) § | 40 (42.3) |
| Oil pan capacity with filter, L (qt.) § | 47.1 (49.7) |
| Oil filter: quantity, type § | 2, Cartridge |
| Oil cooler | Water-Cooled |

§ Kohler recommends the use of Kohler Genuine oil and filters.

## Cooling

| Radiator System | |
|---|---|
| Ambient temperature, °C (°F) * | 50 (122) |
| Engine jacket water capacity, L (gal.) | 43.2 (9.5) |
| Radiator system capacity, including engine, L (gal.) | 227.3 (50) |
| Engine jacket water flow, Lpm (gpm) | 680 (180) |
| Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.) | 284 (16189) |
| Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.) | 47 (2670) |
| Water pump type | Centrifugal |
| Fan diameter, including blades, mm (in.) | 1143 (45) |
| Fan, kWm (HP) | 16 (22) |
| Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. $H_2O$) | 0.125 (0.5) |

* Weather and sound enclosures with internal silencer reduce ambient temperature capability by 8°C (15°F).

## Operation Requirements

| Air Requirements | |
|---|---|
| Radiator-cooled cooling air, $m^3$/min. (scfm)† | 638 (22500) |
| Combustion air, kg/hr. (cfm) | 1227 (687) |
| Heat rejected to ambient air: | |
| Engine, kW (Btu/min.) | 66 (3765) |
| Alternator, kW (Btu/min.) | 23 (1309) |

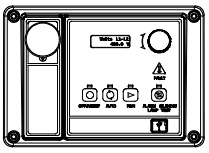
† Air density = 1.20 kg/$m^3$ (0.075 lbm/$ft^3$)

**Fuel Consumption‡**

| Natural Gas, $m^3$/hr. (cfh) at % load | Standby Rating | |
|---|---|---|
| 100% | 85.4 | (3015) |
| 75% | 68.8 | (2428) |
| 50% | 52.2 | (1843) |
| 25% | 38.1 | (1345) |

‡ Nominal fuel rating: Natural gas, 37 MJ/$m^3$ (1000 Btu/$ft.^3$)

## Controllers



**APM402 Controller**

Provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility.

- Digital display and menu control provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or serial configuration
- Controller supports Modbus® protocol
- Integrated hybrid voltage regulator with ±0.5% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-161 for additional controller features and accessories.

Modbus® is a registered trademark of Schneider Electric.

KOHLER

KOHLER CO., Kohler, Wisconsin 53044 USA
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444
KOHLERPower.com

## Standard Features

- Alternator Protection
- Battery Rack and Cables
- Closed Crankcase Ventilation (CCV) with Filters
- Integral Vibration Isolation
- Local Emergency Stop Switch
- Low Coolant Level Shutdown
- Oil Drain Extension
- Operation and Installation Literature
- Three-Way Exhaust Catalyst

## Available Options

**Approvals and Listings**

- ❑ CSA Certified
- ❑ IBC Seismic Certification
- ❑ UL 2200 Listing
- ❑ Hurricane Rated Enclosure

**Enclosed Unit**

- ❑ Sound Enclosure with Internal Silencer (Aluminum)
- ❑ Sound Enclosure with Internal Silencer (Steel)
- ❑ Weather Enclosure with Internal Silencer (Steel)

**Open Unit**

- ❑ Exhaust Silencer, Critical (kit: PA-324470)
- ❑ Flexible Exhaust Connector, Stainless Steel

**Fuel System**

- ❑ Flexible Fuel Lines
  (required when the generator set skid is spring mounted)
- ❑ Gas Filter
- ❑ Secondary Gas Solenoid Valve

**Controller**

- ❑ Communications Products and PC Software
- ❑ Two Input/Five Output Module

- ❑ Remote Serial Annunciator Panel
- ❑ Run Relay
- ❑ Manual Speed Adjust

**Cooling System**

- ❑ Block Heater; 2500 W, 120 V, 1 Ph
- ❑ Block Heater; 6000 W, 208 V, 1 Ph
- ❑ Block Heater; 6000 W, 240 V, 1 Ph or 3 Ph
- ❑ Block Heater; 6000 W, 480 V, 1 Ph
  Recommended for ambient temperatures below 10°C (50°F)
- ❑ Radiator Duct Flange

**Electrical System**

- ❑ Alternator Strip Heater
- ❑ Battery
- ❑ Battery Charger, Equalize/Float Type
- ❑ Battery Charger Temperature Compensation
- ❑ Battery Heater
- ❑ Line Circuit Breaker (NEMA1 enclosure)
- ❑ Line Circuit Breaker with Shunt Trip (NEMA1 enclosure)

**Miscellaneous**

- ❑ Air Cleaner Restriction Indicator
- ❑ Certified Test Report
- ❑ Engine Fluids Added
- ❑ Rated Power Factor Testing
- ❑ Rodent Guards

**Literature**

- ❑ General Maintenance
- ❑ NFPA 110
- ❑ Overhaul
- ❑ Production

**Warranty**

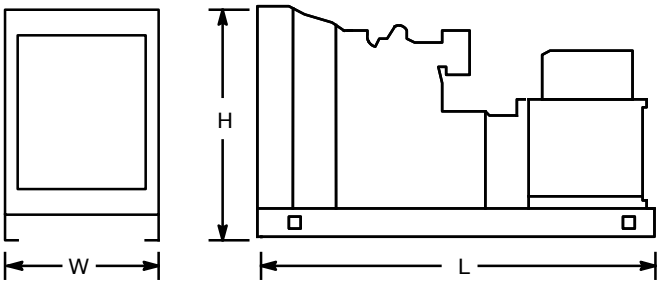
- ❑ 2-Year Basic Limited Warranty
- ❑ 5-Year Basic Limited Warranty
- ❑ 5-Year Comprehensive Limited Warranty

**Other Options**

- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____

## Dimensions and Weights

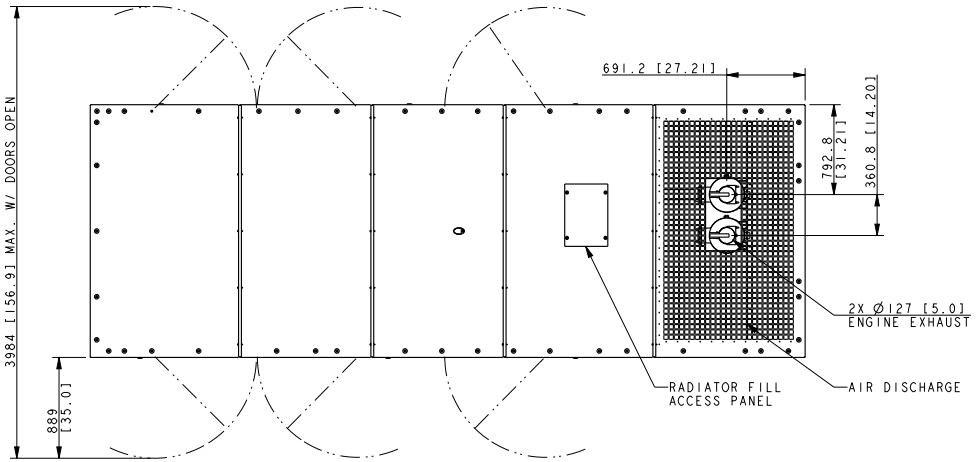
| | |
|---|---|
| Overall Size, L x W x H, max., mm (in.): | 3500 x 1750 x 2148 (137.8 x 68.9 x 84.6) |
| Weight (radiator model), wet, max., kg (lb.): | 3200 (7055) |

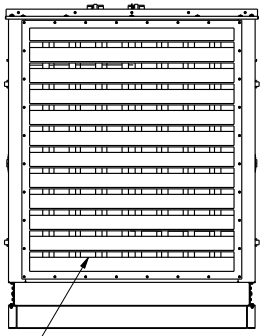


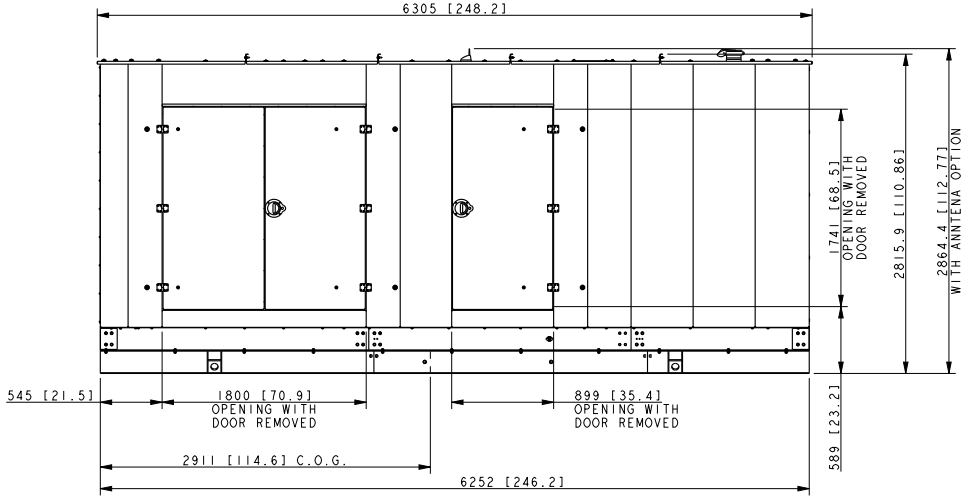

NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

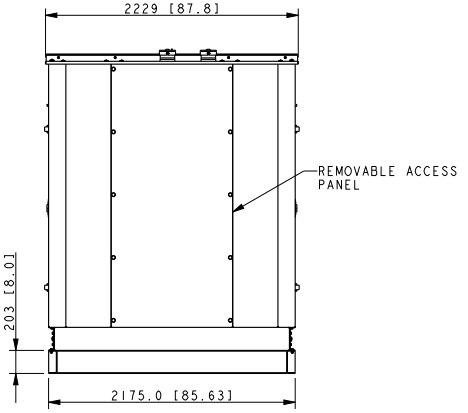
**DISTRIBUTED BY:**

| MODEL | ENCLOSURE WEIGHT | |
|---|---|---|
| 300-350 REZXB / RZXB | STEEL WEATHER | 1315 Kg [2900 LBS] |
| | STEEL SOUND | 1400 Kg [3100 LBS] |
| | ALUMINUM SOUND | 910 Kg [2000 LBS] |




| REV | DATE | ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL | BY |
|---|---|---|---|
| - | 6-2-11 | NEW DRAWING [90394] | GFR |
| A | 11-25-13 | SEE SHEET 3 [CT64662] | SAM |
| B | 7-17-17 | (C-3) NOTE UPDATED, SEE SHEET 2 [CT175008] | CCL |

UNLESS OTHERWISE SPECIFIED:
[1] DIMENSIONS ARE IN MILLIMETERS
[2] TOLERANCES ARE:
X ± 0.25
X.X ± 1.0
ANGLES ± 0° 30'
SURFACE FINISH 1 Max.
THIRD ANGLE PROJECTION

| APPROVALS | | DATE |
|---|---|---|
| DRAWN | GFR | 6-2-11 |
| CHECKED | JMS | 6-2-11 |
| APPROVED | AJD | 6-2-11 |

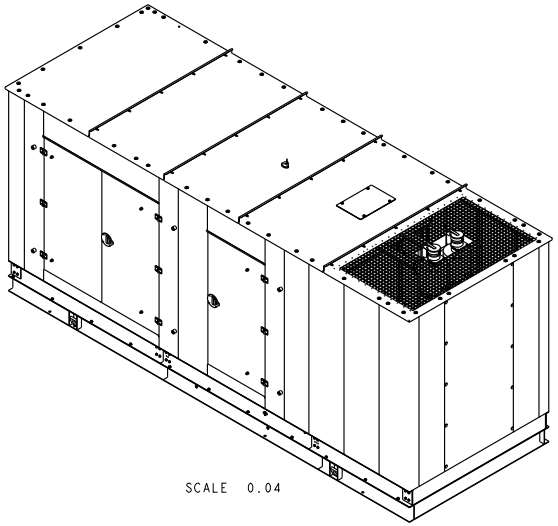
KOHLER CO. METRIC | PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.


TITLE: DIMENSION PRINT

SCALE 0.05 | CAD NO. | SHEET 1 of 3

DWG NO. ADV-8162 | D

300-350kW DOOSAN
ENCLOSURE W/LIFTING BASE



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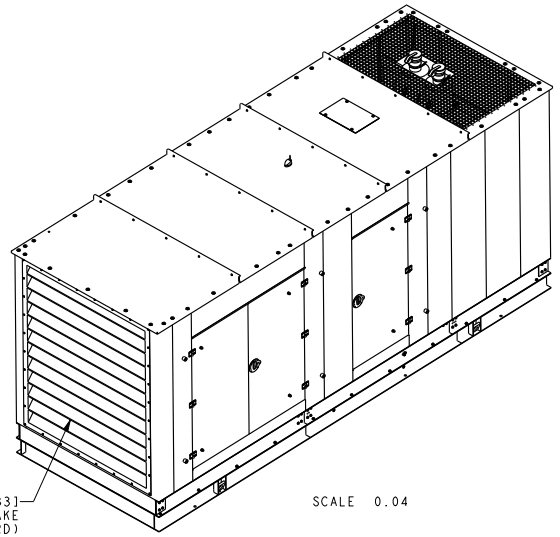
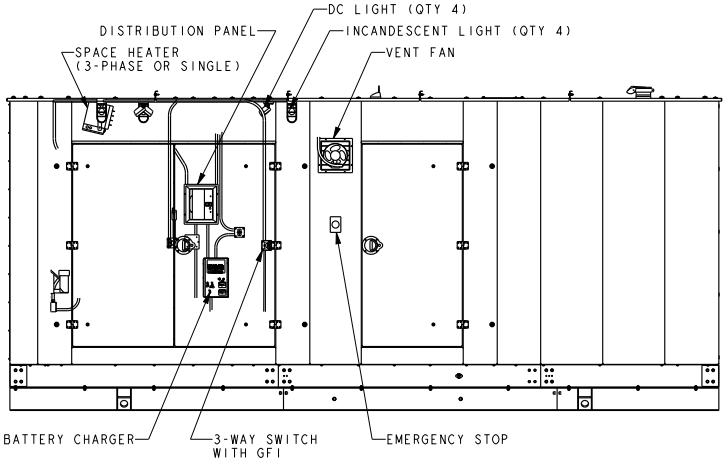
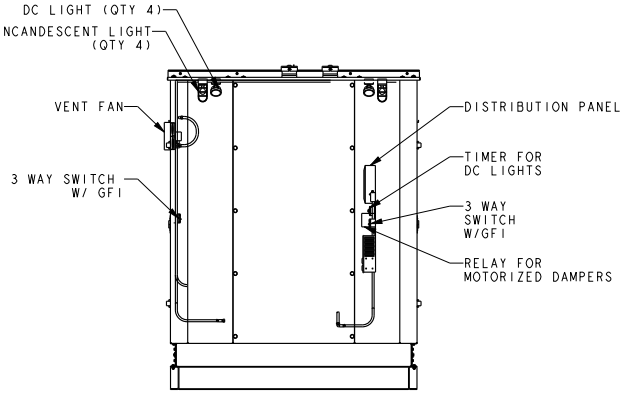


1869 X 2116 [74 X 83]
FIXED AIR INTAKE
LOUVER (STANDARD)
(MOTORIZED LOUVERS OPTIONAL)

SCALE 0.04




| REV | DATE | ON COMPOSITE DWGS, SEE PART NO. FOR REVISION LEVEL | BY |
|---|---|---|---|
| - | 6-2-11 | NEW DRAWING [90394] | GFR |
| A | 11-25-13 | SEE SHEET 3 [CT64662] | SAM |
| B | 7-17-17 | (B-4,-6) VENT FAN LOCATION UPDATED, | |
| | | EMERGENCY STOP LOCATION ADDED, (B-1) VIEW | |
| | | REMOVED, SEE SHEET 1 [CT175008] | CCL |

UNLESS OTHERWISE SPECIFIED,
[1] DIMENSIONS ARE IN MILLIMETERS
[2] TOLERANCES ARE:
X.XX ± 0.25
X.X ± 1.0
X ± 1.5
ANGLES ± 0° 30'
SURFACE FINISH MAX.
THIRD ANGLE PROJECTION

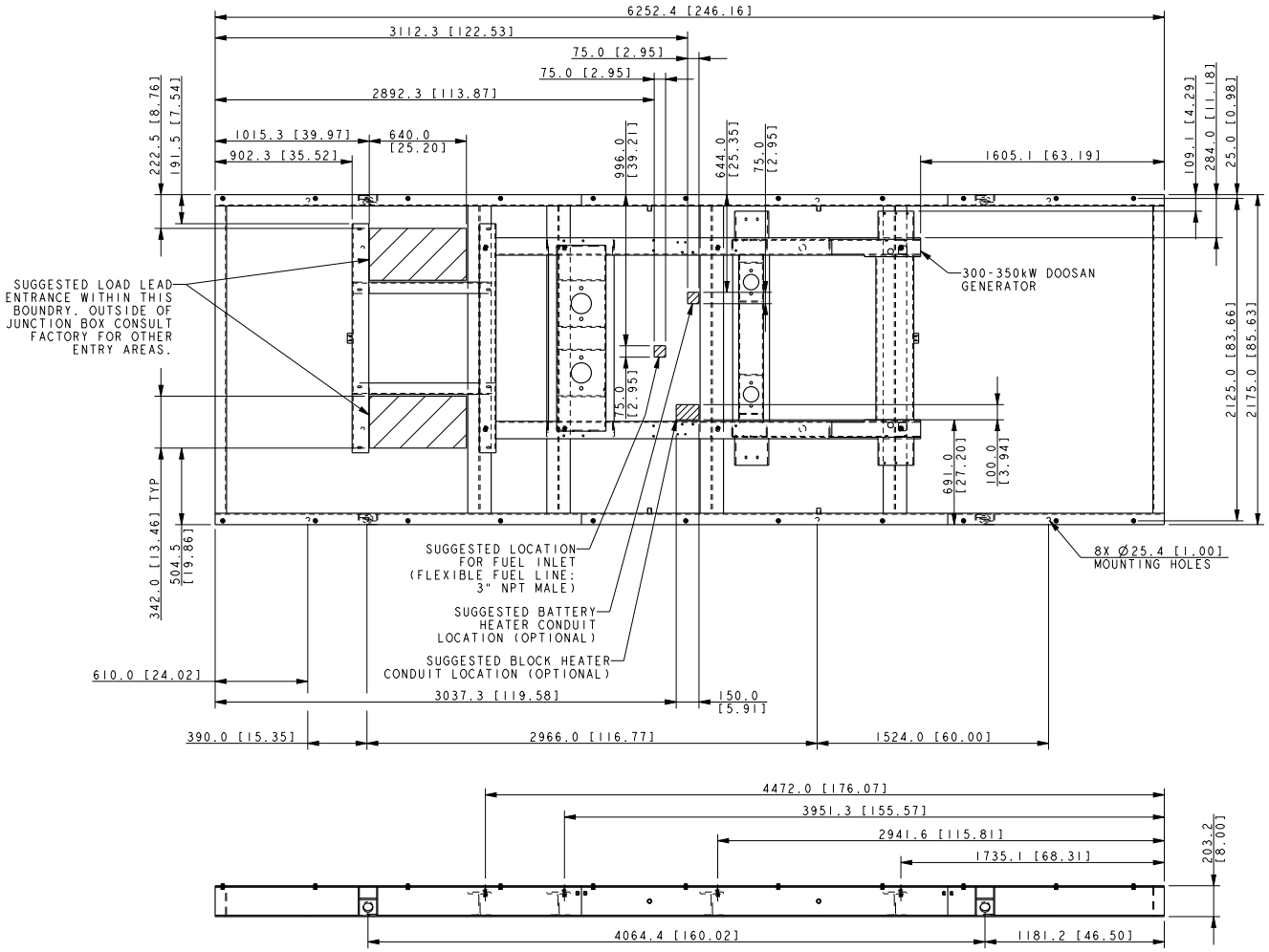
| APPROVALS | DATE |
|---|---|
| DRAWN GFR | 6-2-11 |
| CHECKED JMS | 6-2-11 |
| APPROVED AJD | 6-2-11 |

**300-350kW DOOSAN**
**ENCLOSURE W/LIFTING BASE**

**KOHLER CO.** METRIC | PRO-E
POWER SYSTEMS, KOHLER, WI 53044 U.S.A.


TITLE: **DIMENSION PRINT**

SCALE 0.05 | CAD NO. | SHEET 2 of 3
DWG NO. **ADV-8162** | **D**




| REV | DATE | ON COMPOSITE DWGS. SEE PART NO. FOR REVISION LEVEL | BY |
|---|---|---|---|
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| A | 11-25-13 | (C-3) DIM'S TO HOLES ADDED [CT64662] | SAM |
| B | 7-17-17 | SEE SHEET 1 & 2 [CT175008] | CCL |

UNLESS OTHERWISE SPECIFIED: 1) DIMENSIONS ARE IN MILLIMETERS 2) TOLERANCES ARE: X.XX ± 0.25, X.X ± 1.0, X ± 1.5, ANGLES ± 0° 30' SURFACE FINISH MAX. THIRD ANGLE PROJECTION

| APPROVALS | | DATE |
|---|---|---|
| DRAWN | GFR | 6-2-11 |
| CHECKED | JMS | 6-2-11 |
| APPROVED | AJD | 6-2-11 |

**KOHLER CO.** METRIC | PRO-E

POWER SYSTEMS, KOHLER, WI 53044 U.S.A.



TITLE: **DIMENSION PRINT**

SCALE 0.07 | CAD NO. | SHEET 3 of 3

DWG NO. **ADV-8162** | D

**300-350kW DOOSAN ENCLOSURE W/LIFTING BASE**

Fuller Middle School
Framingham, MA
J#680 015 00.00
L#60589/Page 1/ October 18, 2019

# TECHNOLOGY SYSTEMS

## NARRATIVE REPORT

The following is the Technology Systems narrative, which defines the scope of work and capacities of the Communications system infrastructure, as well as, the Basis of Design.

1. CODES

   A. All work installed under Section 270000 shall comply with the Massachusetts Building Code, IBC 2009, and all local, county, and federal codes, laws, statues, and authorities having jurisdiction.

2. DESIGN INTENT

   A. All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Technology and Security work and all items incidental thereto, including commissioning and testing.

3. TECHNOLOGY

   A. The data system infrastructure will consist of fiber optic backbone cabling. Horizontal wiring will consist of Category 6A UTP Non-Plenum rated cabling for both data and telephone systems for gigabit connectivity. The telephone infrastructure will accommodate VOIP based voice systems. A new IP telephone system will be used.

   B. Each classroom will have two (2) data outlets for student computers. Two (2) data with video and audio connections to a wall mounted touch screen monitor will be provided at teacher's station. A wall phone will be provided for communications with administration in each classroom. Wireless access points will be provided in all classrooms and other spaces with two (2) CAT6A cables.

   C. A central paging system will be provided and integrated with the telephone system. The speakers shall be IP.

   D. A wireless GPS/LAN based master clock system will be provided with 120V wireless remote clocks that act as transceivers.

   E. The Main Distribution Frame (MDF) will contain all core network switching and IP voice switch. Intermediate Distribution Frames (IDFs) will serve each floor/wing of the school. A fiber optic backbone will be provided from each IDF to MDF. The backbone will be designed for 10 Gbps Ethernet.

4. TESTING REQUIREMENTS

The Technology Contractor shall provide testing of the following systems with the Owner and Owner's Representative present:

- Telephone and data cabling
- Fiber optic backbone cabling
- Paging system
- Wireless clock system

Testing reports shall be submitted to the Engineer for review and approval before providing to the Owner.

5. OPERATION MANUALS AND MAINTENANCE MANUALS

When the project is completed, the Technology Contractor shall provide operation and maintenance manuals to the Owner.

6. RECORD DRAWINGS AND CONTROL DOCUMENTS

When the project is completed, an as-built set of drawings, showing all lighting and power requirements from contract and addendum items, will be provided to the Owner.

7. COMMISSIONING

The project shall be commissioned per Commissioning Section of the specifications.

### 3.1.3 Building Code Analysis

Please reference the attached Building Code Analysis.

# Fire Protection and Life Safety Code Compliance Strategy

## FRAMINGHAM FULLER MIDDLE SCHOOL
### FRAMINGHAM, MA

Prepared For:

Jonathan Levi Architects
266 Beacon Street
Boston, MA 02116

Prepared By:

HOWE ENGINEERS
101 Longwater Circle, Suite 203
Norwell, MA 02061
Phone: 781.878.3500
Fax: 781.878.3551

**SUBMITTED: OCTOBER 15, 2019**

**90% Construction Documents - MSBA Submission**

**Table of Contents**

## DOCUMENT HISTORY

*50% Schematic Design Fire Protection and Life Safety Code Compliance Strategy .....August 8, 2018*
*100% Schematic Design Fire Protection and Life Safety Code Compliance Strategy .....September 7, 2018*
*75% Design Development Fire Protection and Life Safety Code Compliance Strategy .....April 8, 2019*
*100% Design Development Fire Protection and Life Safety Code Compliance Strategy ..... May 13, 2019*
*50% Construction Document Fire Protection and Life Safety Code Compliance Strategy .....July 8, 2019*
*60% Construction Document Fire Protection and Life Safety Code Compliance Strategy .....August 9, 2019*
*90% Construction Document Fire Protection and Life Safety Code Compliance Strategy .....August 29, 2019*
*90% Construction Document Fire Protection and Life Safety Code Compliance Strategy ..... October 15, 2019*

This document "Concept Design Fire Protection and Life Safety Code Compliance Strategy" is intended for use by the design team and code officials for understanding the building design concept for the proposed Framingham Fuller Middle School located in Framingham, MA. This document contains the code basis for the building design, functionality of the egress system, fire protection recommendations, the smoke control system design concept, and a comprehensive code outline.

This document is a draft based on the building plans from Jonathan Levi Architects dated October 15, 2019. This document is a work in progress, will be updated as the design progresses and discussions/agreements with the Authorities Having Jurisdiction occur.

## PURPOSE

The purpose of this report is to document and provide the code compliance strategy, including the framework for the fire protection and life safety concept, for the Framingham Fuller Middle School in Framingham, MA. This document will also identify design concepts that are not clearly addressed by the applicable building codes, which will require approval and or interpretation by the authorities having jurisdiction (AHJ).

## APPLICABLE CODES AND REQUIREMENTS

The following codes are presently adopted in the State of Massachusetts:

- **Building** Massachusetts State Building Code (MSBC), 9th Edition, which adopts and amends the 2015 International Building Code and the 2015 International Existing Building Code (IEBC).
- **Accessibility** Massachusetts Architectural Access Board (MAAB), 521-CMR.
  2010 ADA Standards for Accessible Design
- **Electrical** Massachusetts Electrical Code, 527 CMR, 12.00. The Massachusetts Electrical Code is an amended version of the 2017 National Electrical Code (NFPA 70).
- **Elevators** Massachusetts Elevator Regulations, 524-CMR.
- **Energy** 2015 Edition of the International Energy Conservation Code (IECC) as amended by the State of Massachusetts; Massachusetts Stretch Code
- **Fire Prevention** 527 CMR Massachusetts Fire Prevention Code, which adopts and amends the 2015 edition of NFPA 1.
- **Mechanical** International Mechanical Code, 2015 edition, as adopted and amended by the MSBC (Chapter 28).
- **Plumbing** Massachusetts Fuel Gas and Plumbing Codes (248 CMR).
- **Other** National Fire Protection Association (NFPA) Standards, as referenced by the MSBC and the MFPR.

# PROJECT DESCRIPTION

Howe Engineers has prepared this document for the Framingham Fuller Middle School located in Framingham, MA. The proposed building will be a newly constructed, three (3) story building with a footprint area of approximately 64,780 square feet. The building contains primarily Group E Educational spaces for middle school students (6th to 8th grade), with accessory office and lounge spaces. There is a gymnasium and auditorium on the north side of the building that will be considered Group A-3 assembly spaces as public events will be held in these spaces.

This narrative addresses the requirements contained in the 9th edition of 780 CMR, The Massachusetts State Building Code (MSBC), which is an amended version of the 2015 International Building Code (IBC).

## GENERAL OPERATING ASSUMPTIONS

The following general operating assumptions serve as the basis for the Life Safety and Fire Protection design and should be incorporated into the new facilities operations plan. It is the responsibility of the Owner/Operator to ensure that these assumptions are enforced:

- The materials used shall meet the interior finish requirements of the International Building, and NFPA 1.
- Hazardous materials and explosives are not permitted within the Building unless protected in accordance with the International Building and Fire Codes and approved by the Authority Having Jurisdiction.

## NEW CONSTRUCTION- CODE COMPLIANCE APPROACH

### *OCCUPANCY CLASSIFICATION*

The proposed Fuller School is classified as Mixed Use, containing Educational, Group E Occupancies, along with Assembly Group A and Business Group B Occupancies. The building serves as an educational building for students from the 6th through 8th grade containing primarily classroom spaces. There is a gymnasium and auditorium on the north side of the building which will likely hold events for the general public. As these spaces will hold events for the public, they must be considered Assembly spaces as they will accommodate occupants other than the students of the Fuller School. The occupancies in the building on the respective levels are as follows:

| **First Floor (Level of Exit Discharge)** | **USE GROUP** |
|---|---|
| Classrooms / Lab Spaces | E |
| Gymnasium | A-4 |
| Auditorium / Lounge Space | A-3 |
| Office / Administration | B |
| Storage | S-1 |
| MEP | S-2 |
| **Second Floor** | **USE GROUP** |
| Classrooms | E |
| Office / Administration | B |
| Lounge / Breakout Space | A-3 |
| Storage | S-1 |
| MEP | S-2 |
| **Third Floor** | **USE GROUP** |
| Classrooms | E |
| Office / Administration | B |
| Lounge / Breakout Space | A-3 |
| Storage | S-1 |
| MEP | S-2 |

### *OCCUPANCY SEPARATIONS*

The Building contains a number of different occupancies, not included in the same occupancy group, within the building and is classified as Mixed-Use Occupancy in accordance with MSBC Section 508.1. Therefore, the building is required to comply with the requirements of either Section 508.3 (non-separated uses) or Section 508.4 (separated uses), or combinations of these sections. As the gymnasium, auditorium, and cafeteria on the first floor of the building will be used for public events, they must be considered assembly spaces. A nonseparated, mixed-use approach will be used for the design of the building to limit the required rated separations between occupancies. Refer to the Building Construction section below for minimum construction type necessary to allow for the application of the nonseparated mixed-use provisions.

# BUILDING CONSTRUCTION

### *CONSTRUCTION TYPE*

The Framingham Fuller School will be newly constructed using a nonseparated mixed-use approach. The building is three (3) stories in height, containing primarily Group A and E occupancies, with Group A Assembly spaces primarily consisting of the Gymnasium, Auditorium, and Cafeteria on the first floor. The building will be designed as Type IB fire resistive, non-combustible construction.

Under Type IB Construction, Group E occupancies are permitted to be six (6) stories in height with unlimited area per floor. Group A occupancies are permitted to be twelve (12) stories in height with unlimited area per floor. As the gymnasium, auditorium, and cafeteria will be used for public events, they are classified as Group A-3 spaces, while the balance of the school is classified as Group E educational use. The current design does not include occupancy separations as the building is permitted to be unlimited in area. As the building is 3-stories in height and permitted to have unlimited area, the current design is compliant.

In order to demonstrate compliance with the allowable building area requirements of MSBC Section 506, the sum of the ratios on each floor must be individually analyzed. This approach involves taking the area of each occupancy, and dividing this area by the allowable area of each occupancy on a floor-by-floor basis (MSBC Section 506.2.4). As the building is permitted to have unlimited area on each floor, the sum of the ratios calculation is not applicable.

As the building will be of Type IB construction, the stairs and shafts must be constructed of 2-hour construction as Type IB requires a 2-hour rated floor assembly.

### *FIRE RESISTANCE RATING*

The fire-resistance rating requirements for Type IB construction can be found in MSBC Table 601. The fire-resistance ratings for the building structural elements are as follows:

### Fire Resistance Ratings of Structural Elements for Type IB Construction

| BUILDING STRUCTURAL ELEMENT | FIRE RESISTANCE RATING – TYPE IB |
|---|---|
| **Structural Frame** | |
| Including girders, beams and trusses (other than columns): | |
| Supporting a floor | 2-hour |
| Supporting roof only | 1-hour |
| Columns: | |
| Supporting a floor | 2-hour |
| Supporting roof only | 1-hour |
| **Bearing Walls** | |
| Exterior | 2-hour |
| Interior Walls: | |
| Supporting more than one floor | 2-hour |
| Supporting only roof | 2-hour |
| **Nonbearing Walls and Partitions** | |
| Exterior *(not less than fire separation requirements)* | See Fire Separation |
| Interior *(not less than fire separation requirements)* | 0-hours |
| **Floor Construction** | |
| Including supporting beams and joists | 2-hour |
| **Roof Construction** | |
| *Including supporting beams and joists:* | |
| Less than 20' in height to lowest member | 1-hours |
| 20' or more in height to lowest member | 0-hours |

### Roof Rating Approach

MSBC Table 601 (summarized above) governs the required fire resistance rating of structural members in Type IB construction. Both the proposed gymnasium and auditorium spaces are designed with high ceilings (in excess of 20-feet). Roof construction and associated secondary members for buildings of Type IB construction are required to be provided with a 1-hour fire resistance rating in accordance with MSBC Table 601. Table 601 provides that fire protection of structural roof members (including decking) is not required where every part of the roof construction is 20 feet or more above any floor immediately below. The 2018 IBC, though not applicable, provides guidance on the requirements outlined in Table 601. Table 601 permits the reduction in roof rating for all primary and secondary structural members where the roof is located more than 20 feet above the any floor immediately below. Primary structural frame is defined as follows:

> **[BG] PRIMARY STRUCTURAL FRAME.** The primary structural frame shall include all of the following structural members:
>
> 1. The columns.
> 2. Structural members having direct connections to the columns, including girders, beams, trusses and spandrels.
> 3. Members of the floor construction and roof construction having direct connections to the columns.
> 4. Bracing members that are essential to the vertical stability of the primary structural frame under gravity loading shall be considered part of the primary structural frame whether or not the bracing member carries gravity *loads*.

As such, columns, structural roof members connecting directly to columns, and members needed for vertical stability of the building still require a 1-hour rating in accordance with Table 601, but other roof members are permitted to be non-rated in accordance with Footnote B of Table 601. Additionally, the 2018 IBC commentary provides further guidance on the intent of the code regarding the rating of primary and secondary roof members (below). As the proposed roof in both the auditorium and gymnasium is greater than 20 feet above the floor below, the design team has requested to utilize Footnote B of Table 601 to rate only the columns with none of the roof members located in or at the roof, including primary members, being rated.

Note b applies to the construction of the roof and related secondary members in all types of construction. It allows these elements to be of unprotected construction when all parts of the roof construction are more than 20 feet (6096 mm) above any floor below. This footnote was revised for 2018 to clarify that this allowance applies to both the primary and secondary members of the roof structure. This alternative is applicable for all occupancy classifications except Groups F-1, H, M and S-1.

***EXTERIOR WALLS***

The MSBC regulates the fire resistance rating of exterior walls and the extent to which protected and unprotected openings are permitted in the exterior walls of facing buildings based on the fire separation distance to the lot line or to the center of the street (MSBC Table 602 and Table 705.8).

It should be noted that the Farley building is located approximately 40-feet away from the proposed Fuller School. The Farley building is constructed of non-combustible brick exterior walls. As such, the Fuller School is not provided with 100% open frontage on all sides. **The existing Farley Building was confirmed by JLA to be of masonry construction, with no exterior openings on the portions closest to the proposed Fuller School.**

**In order to determine the allowable openings and rating of the exterior walls of the Fuller School, an assumed lot line must be developed between the Farley building and the Fuller School. Based on the masonry exterior walls of the Farley Building, it is assumed that the Farley Building is provided with 1-hour rated exterior walls. With no openings in the exterior wall, the Fuller School will be permitted to have unlimited openings and a non-rated exterior wall. Specific detail of the Farley wall construction should be provided for a detailed review to ensure a 1-hour rated exterior wall exists.**

## Fire Resistance Rating for Exterior Non-Loading-Bearing Walls

Based on Fire Separation Distance (IBC Table 602)

| FIRE SEPARATION DISTANCE (Building wall to property line for each side of the building) | FIRE-RESISTANCE RATING (GROUP A, B, E, S-2) |
|---|---|
| ***Less than 5 feet*** | 1-hour |
| ***Greater than or equal to 5 feet and less than 10 feet*** | 1-hour |
| ***Greater than or equal to 10 feet and less than 30 feet*** | 1-hour |
| ***Greater than or equal to 30 feet*** | 0-hour |

The required fire-resistance rating of exterior walls with a fire separation distance of greater than 10 feet must be rated for exposure to fire from the inside. The required fire-resistance rating of exterior walls with a fire separation distance of less than or equal to 10 feet must be rated for exposure to fire from both sides.

## Maximum Area of Exterior Wall Openings

Based on IBC Table 705.8

| Fire Separation Distance to Lot Line (feet) | Allowable Area of Opening (Sprinklered) |
|---|---|
| 0 to less than 3 | Not Permitted |
| 3 to less than 5 | 15% |
| 5 to less than 10 | 25% |
| 10 to less than 15 | 45% |
| 15 to less than 20 | 75% |
| 20 to less than 25 | No Limit |
| 25 to less than 30 | No Limit |
| 30 or greater | No Limit |

**The Farley building is not provided with openings on the portions of the building that will face the proposed Fuller School. As mentioned above, the allowable openings of the Fuller School will be determined upon confirmation of the assumed lot line between the Fuller School and the Farley Building. The Fuller School will likely be permitted to have unlimited openings based on the 1-hour rated exterior walls and lack of openings in the Farley Building.**

### Fire Resistant Joint Systems

Joints installed in or between fire-rated walls, floors or floor/ceiling assemblies and roofs or roof/ceiling assemblies must be protected by an approved fire-resistant joint assembly having a rating equal to the rating of the wall, floor, or roof. Joint systems shall be tested in accordance with MSBC Section 715.0.

Listed and approved joint assemblies must be provided for all concealed locations where fire resistance rated assemblies form a joint.

### Interior Finishes and Floor Finishes

Interior finishes in the building are required to meet the requirements of MSBC Section 803 for Interior Finish. Refer to the following tables for details. Interior finish applies to wall and ceiling finishes. Interior floor finish applies to floor coverings.

### Interior Wall & Ceiling Finish Requirements by Occupancy

Sprinklered Building (Table 803.11)

| USE GROUP | VERTICAL EXITS AND PASSAGEWAYS | EXIT ACCESS CORRIDORS | ROOMS AND ENCLOSED SPACES |
|---|---|---|---|
| A-3 | A or B | A or B | A, B, or C |
| B / E | A or B | A, B, or C | A, B, or C |
| S | A, B, or C | A, B, or C | A, B, or C |
| Atrium | A or B | A or B | A or B |

### Interior Floor Finish Requirements by Occupancy

Interior floor finish and floor coverings must comply with IBC Section 804, unless the floor finish or covering material is of traditional type, such as wood, vinyl, linoleum, or terrazzo and resilient floor covering materials not comprised of fibers.

## *LABORATORY HAZARDOUS CHEMICAL STORAGE*

## Control Area Approach

The MSBC permits limited amounts of hazardous materials in a Use Group E Educational Occupancies. Under this approach, each floor of the building is permitted to have a certain number of Control Areas that are separated by fire resistance rated construction. The number of Control Areas and quantity of hazardous materials permitted on each floor varies based on the ease of fire department access to those given spaces.

The control areas should be separated from adjacent spaces by one (1)-hour fire resistance rated separations on the First through Third Floors (MSBC Table 414.2.2). The required fire resistance rating for the floors and their supporting construction is one (1) hour rated, which is satisfied by the 2-hour floors per Type IB Construction. Doors in the one (1)-hour control area separation should be rated for ¾-hour and doors (MSBC Table 716.5). It should be noted that unprotected vertical openings are not permitted in control areas, unless a sum of the ratios for chemical quantity is utilized.

Multiple control areas per floor can be provided if they are separated with fire resistance rated fire barrier. Table 414.2.2 of the MSBC (shown below) provides the requirements for control area design by floor level in the building. It should be noted that the number of control areas permitted, and the maximum allowable quantity of hazardous materials permitted per control area is reduced on floors above and below grade. Hazardous materials in storage and in use within this control area will be limited to the quantities specified in MSBC Table 307.1 (1) and (2). The quantity limits shown include an allowable increase for approved storage and automatic sprinkler protection.

**MSBC Table 414.2.2 Design and Number of Control Areas**

| Floor Level | | Percentage of the Maximum Allowable Quantity Per Control Area | Number of Control Areas Per Floor | Fire-Resistance Rating for Fire Barriers in Hours | Actual Control Areas Provided |
|---|---|---|---|---|---|
| Above | 3 | 50 | 2 | 1 | 2 |
| Grade | 2 | 75 | 3 | 1 | 1 |
| Plane | 1 | 100 | 4 | 1 | 2 |

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 307.1(1) and 307.1(2) with all increases allowed in the notes to those tables

b. Fire barriers shall include walls and floors and supporting construction as necessary to provide separation from other portions of the building.

As can be seen from the table above, the First Floor is allowed to have four (4) control areas. Above grade floors are permitted to have fewer control areas and each control area above grade is permitted to store less hazardous materials.

Table 414.2.2 of the MSBC (shown above) provides the requirements for control area design by floor level in the building. The IBC has a defined threshold for when an occupancy must be classified as a Group H High Hazard occupancy. The maximum allowable quantity per control area for hazardous materials is found in IBC Section 307. **If the quantities from Table 307.1(1) are exceeded, the occupancy must be classified as a Group H occupancy.** Table 307.1(1) also indicates what Hazard Occupancy Group (Group H-1 through H-5) the building must be classified as when the quantities in Table 307.1(1) are exceeded.

**As previously detailed in the report, an atrium connects the three (3) floors of the building. There should be multiple control areas per floor, which would require that rated walls separate the science classrooms from the balance of the building which entails 1-hour rated separations per NFPA 45. The science classrooms on Levels 1 and 2 are currently designed with fume hoods and will be used for chemical storage. The lab spaces on Level 3 are not provided with fume hoods but are expected to be used for chemical storage, thus will be protected as their own control area.**

**The design approach for control areas in the building incudes separating the two (2) science lab spaces on Levels 1, 2 and 3 from the balance of the building with 1-hour rated construction. As the floors of the building are 2-hour rated (based on Type IB Construction), each group of science classrooms can be considered its own control area as the classrooms will be separated from the spaces above and the spaces below by 2-hour construction, and separated from the adjacent spaces (including the atrium) by 1-hour rated construction. The lab approach has been reviewed with the City of Framingham Inspectional Services Department.**

## Fire Code Requirements for Hazardous Chemicals

The Massachusetts Fire Code 527 CMR adopts and amends the 2015 version of NFPA 1. Chapter 66 from the Massachusetts fire code contains the requirements for Flammable and combustible liquids. The Massachusetts fire code requires that the storage, handling and use of flammable or combustible liquids comply with NFPA

30. According to Section 1.5.3, a laboratory installation made in accordance with NFPA 45 is determined to be incompliance with NFPA 30.

**66.1.1*** The storage, handling, and use of flammable and combustible liquids, including waste liquids, as herein defined and classified, shall comply with this chapter; NFPA 30, *Flammable and Combustible Liquids Code*; Sections 60.1 through 60.4 of this *Code; and* NFPA 35 *Standards for the Manufacture of Organic Coatings, as applicable.*

## Most restrictive requirements NFPA 30 and NFPA 45-

It is noted that NFPA 30 does not govern storage of liquids in a laboratory. In the open work area of the laboratory, the quantity of flammable liquid in the work area is governed by NFPA 45, which is the standard on fire protection for laboratories using chemicals.

The Massachusetts Fire Code Section 66.1.4 from the states that a laboratory that is installed in accordance with NFPA 45 is considered in compliance with the NFPA 1. Furthermore, it is noted that in accordance with Section 1.5.3 of NFPA 30, a laboratory that is installed in accordance with NFPA 45 is considered in compliance with NFPA 30.

**As discussed above, Howe Engineers confirmed with the staff liaisons for NFPA 30 & NFPA 45 that a laboratory installed in compliance with NFPA 45 is considered to be in compliance with NFPA 30 per Section 1.5.3 of NFPA 30.**

**1.5.3** Installations made in accordance with the applicable requirements of the following standards shall be deemed to be in compliance with this code:

(1) NFPA 1, *Fire Code*
(2) NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*
(3) NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*
(4) NFPA 31, *Standard for the Installation of Oil-Burning Equipment*
(5) NFPA 32, *Standard for Drycleaning Plants*
(6) NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*
(7) NFPA 34, *Standard for Dipping, Coating, and Printing Processes Using Flammable or Combustible Liquids*
(8) NFPA 35, *Standard for the Manufacture of Organic Coatings*
(9) NFPA 36, *Standard for Solvent Extraction Plants*
(10) NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines*
(11) NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*
(12) NFPA 99, *Health Care Facilities Code*
(13) NFPA *101*, *Life Safety Code*

**Figure 1: NFPA 30 Section 1.5.3 states installations made in accordance with NFPA 45 are considered in compliance with NFPA 30.**

**66.1.4** Installations made in accordance with the applicable requirements of the following standards shall be deemed to be in compliance with this *Code*.

(1) NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*
(2) NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages*
(3) NFPA 31, *Standard for the Installation of Oil-Burning Equipment*
(4) NFPA 32, *Standard for Drycleaning Plants*
(5) NFPA 33, *Standard for Spray Application Using Flammable or Combustible Materials*
(6) NFPA 34, *Standard for Dipping, Coating, and Printing Processes Using Flammable or Combustible Liquids*
(7) NFPA 35, *Standard for the Manufacture of Organic Coatings*
(8) NFPA 36, *Standard for Solvent Extraction Plants*
(9) NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines*
(10) NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*
(11) NFPA 99, *Health Care Facilities Code*
(12) NFPA *101*, *Life Safety Code*

**Figure 2: NFPA 1 Section 66.1.4 states installations made in accordance with NFPA 45 are considered in compliance with NFPA 1.**

## NFPA 45 Laboratory Installation Requirements

In NFPA 45, Laboratories are classified as Laboratory Units A through D. Classification A representing a high hazard and D minimum fire hazard. The difference being the quantity of flammable and combustible liquids permitted to be utilized in the laboratory. Table 5.1.1 from NFPA 45 contains the requirements for the separation, maximum area and number of stories above and below grade that a lab can be located. This table is similar to the requirements contained in Table 414 of the International Building Code. (It is noted for reference that Table 5.1.1 has been updated in the 2015 version of NFPA 45 to clarify that Class C and D laboratories are permitted to be located in a story below grade.) In accordance with Table 5.1.1, fire separation is not required for Class C or D laboratories for Educational Buildings and be limited to 50% of the values shown in the table on the next page.

**Table 5.1.1 Separation Requirements and Height Allowances for Laboratory Units**

| Laboratory Unit[a] | Area of Lab Unit | Fire Separation[b] | Permitted Stories Above Grade |
|---|---|---|---|
| A | ≤929 $m^2$ (≤10,000 $ft^2$) | 2 hours | 1–3[c] |
| | >929 $m^2$ (>10,000 $ft^2$) | Not permitted[d] | |
| B | ≤929 $m^2$ (≤10,000 $ft^2$) | 1 hour | 1–3[c] |
| | ≤929 $m^2$ (≤10,000 $ft^2$) | 2 hours | 4–6[c] |
| | >929 $m^2$ (>10,000 $ft^2$) | Not permitted[d] | |
| C | Any size | Not required | 1–3 |
| | Any size | 1 hour | 4–6 |
| | Any size | 2 hours | Over 6 |
| D | Any size | Not required | No limit |

[a]Refer to Table 10.1.1 for laboratory unit classification.
[b]Separation in this table refers to separation from laboratory unit(s) to non-laboratory areas and/or separations from laboratory unit(s) of equal or lower hazard classification.
[c]Not allowed in structures below grade.
[d]Labs of this classification and size are not permitted.

## NFPA 45 Requirements for Maximum Allowable Quantities of Flammable Liquids.

Chapter 10 from NFPA 45 contains the quantity limitations for flammable and combustible liquids. The maximum allowable quantities for flammable and combustible liquids can be found in Table 10.1.1(b) (See Table 10.1.1(b) below).

**Table 10.1.1(b) Maximum Quantities of Flammable and Combustible Liquids in Laboratory Units Outside of Inside Liquid Storage Areas (U.S. Customary Units)**

| Laboratory Unit Fire Hazard Class | Flammable and Combustible Liquid Class[a] | Quantities in Use[a] | | Quantities in Use and Storage[a] | |
|---|---|---|---|---|---|
| | | Maximum Quantity[b] per 100 ft² of Laboratory Unit[c] | Maximum Quantity[b] per Laboratory Unit | Maximum Quantity[b] per 100 ft² of Laboratory Unit[c] | Maximum Quantity[b] per Laboratory Unit |
| | | gal | gal | gal | gal |
| A (high fire hazard) | I | 10 | 480 | 20 | 480 |
| | I, II, and IIIA | 20 | 800 | 40 | 1600 |
| B[d] (moderate fire hazard) | I | 5 | 300 | 10 | 480 |
| | I, II, and IIIA | 10 | 400 | 20 | 800 |
| C[e] (low fire hazard) | I | 2 | 150 | 4 | 300 |
| | I, II, and IIIA | 4 | 200 | 8 | 400 |
| D[e] (minimal fire hazard) | I | 1 | 75 | 2 | 150 |
| | I, II, and IIIA | 1 | 75 | 2 | 150 |

Note: For maximum container sizes, see Table 10.1.2.

[a] The maximum amount in use in open systems is limited to 10 percent of the quantities listed.

[b] See 4.2.2 for additional requirements for educational and instructional laboratories.

[c] The quantities per 100 ft² do not imply the quantities must be within that 100 ft² area; the quantities per 100 ft² are for calculation purposes to determine the total quantity allowed per laboratory work area and the total amount overall in the laboratory unit.

[d] Reduce quantities by 50 percent for B laboratory units located above the 3rd floor.

[e] Reduce quantities by 25 percent for C and D laboratory units located on the 4th–6th floors of a building and reduce quantities by 50 percent for C and D laboratory units located above the 6th floor.

- **The maximum allowable quantity permitted by Table 10.1.1 is based on a per 100 sq. ft. of laboratory area.**

## NFPA 45 Instructional Laboratory classification

It is noted that NFPA 45 has a designation for Instructional Laboratories, which is classified as a lab that is used for educational purposes for college aged students. Experiments and testing in an Instructional Lab is typically conducted under supervision of a lab instructor.

> **3.3.31 Instructional Laboratory Unit.** A laboratory unit used for education past the 12th grade and before post-college graduate-level instruction for the purposes of instruction of six or more persons for four or more hours per day or more than 12 hours per week. Experiments and tests conducted in instructional laboratory units are under the direct supervision of an instructor. Laboratory units used for graduate or post-graduate research are not to be considered instructional laboratory units.

## Summary of the Maximum Allowable Quantities from IBC, NFPA 30 and NFPA 45

Howe Engineers has provided the following table to summarize the various requirements for maximum allowable quantities from the International Building Code, NFPA 30 and NFPA 45. It is noted that NFPA 45 is most restrictive in the maximum allowable quantities for storage and use of flammable and combustible liquids. It is noted that the maximum allowable quantities in Table 1 assumed that the NFPA 45 maximum allowable quantities are not reduced due to the floor area of the laboratory. **The maximum allowable quantity permitted by NFPA 45 Table 10.1.1 is based on a per 100 sq. ft. of laboratory area and a reduction of 50% of the maximum allowable quantity listed in the table below per the Educational requirements**

Please refer to Table 1 below for the for maximum allowable quantities from the International Building Code, NFPA 30 and NFPA 45:

***PENETRATIONS OF DUCT AND AIR TRANSFER OPENINGS***

## MEP Shaft Enclosures

A shaft is required when the duct penetrates two (2) or more floor/ceiling assemblies (MSBC Section 717.6.1). A shaft is not required in occupancies other than Groups I-2 and I-3, for a duct constructed of approved materials in accordance with the International Mechanical Code that penetrates not more than one (1) fire-resistance-rated floor/ceiling assembly (connecting only 2 stories), provided a listed fire damper is installed at the floor line or the duct is protected in accordance with MSBC Section 714.4 (MSBC Section 717.6).

MSBC Section 713.4 provides that shafts connecting less than four (4) stories, a 1-hour fire rated shaft enclosure is required. Shafts connecting four (4) or more stories require a fire-resistance rating of at least two (2) hours. Additionally, shaft enclosures must not have a fire resistance rating that is less than the rating of the floor that they are penetrating, but need not exceed two (2) hours. Openings in a shaft enclosure are required to be limited to those necessary for the purpose of the shaft (MSBC Section 713.8.1). Where shafts do not extend to the top or bottom of a building, adequate protection should be provided (MSBC Section 713.11 and Section 713.12). **It should be noted that as the building is of Type IB construction, shafts must be provided with a 2-hour fire resistance rating as they penetrate 2-hour rated floor assemblies.**

**The building will have shafts at each bathroom suite to accommodate bathroom exhaust. Additionally, shafts will be located above the administrative suites to accommodate ductwork associated with these office areas. Finally, kiln exhaust and various fume hoods throughout the building will be provided with 2-hour rated shafts.**

## Fire Dampers

Fire dampers should have a fire resistance rating in accordance with the table below (MSBC Table 717.3.2.1). The actuation temperature of the actuating device should be approximately 50˚F above the normal temperature within the duct system (MSBC Section 717.3.3.1). If a fusible link is used, it should have a temperature rating not less than 160˚F (MSBC Section 717.3.3.1).

## Fire Damper Rating

| Type of Penetration | Minimum Fire Damper Rating |
|---|---|
| Less than 3-hour fire-resistance rated assemblies | 1½ hours |
| 3 hour or greater fire-resistance rated assemblies | 3 hours |

Fire dampers are required at locations where ducts or air transfer openings of an air distribution system penetrate fire resistance rated assemblies including the following:

- Fire barriers (MSBC Section 717.5.2);
- Shaft enclosures (MSBC Section 717.5.3);
- Fire partitions (MSBC Section 717.5.4);
- Horizontal assemblies (MSBC Section 717.6).

### Smoke Dampers

Actuation of smoke dampers should be achieved in accordance with the table below (MSBC Section 717.3.3.2).

**Smoke Damper Actuation Methods**

| Damper Location | Activation Method |
|---|---|
| Within a duct | Activation controlled by a smoke detector within 5-feet of the damper with no air outlets or inlets between the detector and the damper. |
| Above smoke barrier doors in a smoke barrier | Activation controlled by a spot type detector listed for releasing service should be installed on both sides of the smoke barrier door opening. |
| In an un-ducted opening in a wall | Activation controlled by a spot type detector listed for releasing service should be installed within 5-feet of the damper. |
| In a corridor wall | Activation controlled by smoke detector system in the corridor. |
| All | Where a total-coverage smoke detector system is provided within areas served by HVAC system, dampers are permitted to be controlled by the smoke detection system. |

Smoke dampers are required at locations where ducts or air transfer openings of an air distribution system penetrate assemblies; including:

- Shaft enclosures (MSBC Section 717.5.3);
- Smoke barrier walls (MSBC Section 717.5.5);
- Horizontal Exits in fire walls (MSBC Section 717.5.1);
- Corridors (MSBC Section 717.5.4.1);
- Smoke Partitions (MSBC Section 717.5.7).
- Smoke-tight construction (MSBC Section 509.4.2)

**It should be noted that smoke dampers are not required in smoke control systems where actuation of the damper would interfere with the operation of the smoke control system (717.5.3 Exception 3).**

**The table below reiterates smoke damper (SD) requirements and provides a number of exceptions in accordance with the MSBC.**

### Combination Smoke/ Fire Dampers

Where penetration of a smoke barrier is required to be provided with a fire damper, a combination fire and smoke damper equipped and arranged to be both smoke and heat responsive should be provided (MSBC 717.5). Combination smoke / fire dampers are required in the following location:

- Shaft penetrations (MSBC 717.5.3).

**The table below reiterates combination smoke / fire damper requirements and provides a number of exceptions in accordance with the MSBC.**

**Through Penetration Protection**

Penetrations into or through fire barriers, smoke barrier walls, fire partitions, floor/ceiling assemblies, or the ceiling membrane of a roof/ceiling assembly are required to be protected with an approved penetration or membrane penetration assembly (MSBC 708). See MSBC 708 for exceptions.

## Damper Exceptions

The table below been developed by Howe Engineers in identifying where dampers are required and where exceptions exist.

| | FD | SD | MSBC | Applicable SD, FD & SD/FD Damper Exceptions |
|---|---|---|---|---|
| **Fire Barriers (including horizontal exits)[1]** | Required | Not Required (NR) | 717.5.2 | Penetrations tested in accordance with ASTM E119 as part of a fire-resistance rated assembly **(FD)**. **[MSBC §717.5.2 Exception 1]** |
| | | | | Ducts used as part of an approved smoke control system **(FD)**. **[MSBC 717.5.2 Exception 2]** |
| | | | | Where fire barriers walls have a FRR of less than 1-hour and the following conditions apply:<br>• The Building is protected throughout by automatic sprinklers;<br>• Penetrations are limited to a ducted HVAC system conveying supply, return or exhaust air;<br>• HVAC ducts are minimally 26 gage;<br>• HVAC ducts are continuous from the AHU to the air outlet and inlet terminals **(FD)**. **[MSBC 717.5.2 Exception 3]** |
| **Smoke Barriers[2]** | NR | Required | 717.5.5 | Smoke dampers are not required where openings in ducts are limited to a single smoke compartment and ducts are constructed of steel **(SD)**. **[MSBC 717.5.5 Exception 1]** |
| **Floor / Ceiling Assemblies** | Required | NR | 717.6.1 | A duct is permitted to penetrate two floors or less with a fire damper at each floor provided it meets all the requirements in 717.6.1 Exception **(FD)**. **[MSBC 717.6.1 Exception]** |
| **Shafts** | Fire / Smoke Dampers Required | | 717.5.3 | Steel exhaust sub ducts extending at least 22-inches vertically in an exhaust shaft provided there is a continuous upward airflow to the outside **(FD)**. **[MSBC 717.5.3 Exception 1.1]** |
| | | | | Penetrations tested in accordance with ASTM E119 as part of a fire-resistance rated assembly **(FD)**. **[MSBC 717.5.3 Exception 1.2]** |
| | | | | Ducts used as part of an approved smoke control system **(FD)**. **[MSBC 717.5.3 Exception 1.3]** |
| | | | | Fire dampers and combination fire/smoke dampers are not required in kitchen and clothes dryer exhaust systems when installed in accordance with the International Mechanical Code **(SD/FD). [MSBC 717.5.3 Exception 5].** A duct that penetrates a fire-resistance rated floor/ceiling assembly that connects not more than 2 stories is permitted without a shaft enclosure, provided that a listed fire damper is installed at the floor line. **[MSBC 717.6.3].** |
| | | | | Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust sub ducts, having a minimum wall thickness of 0.187-inch (No. 26 gage), the sub ducts extend at least 22 inches vertically, and an exhaust fan providing continuous airflow to the outside is installed at the top of the shaft terminal. The exhaust fan should be provided with an uninterruptible power system for the first 15 minutes of loss of primary power **(SD)**. **[MSBC 717.5.3 Exception 2 for Group B and R occupancies only]** |
| **Corridors** | NR | Required | 717.5.4 | Ductwork has a minimum wall thickness of 0.019 inches and there are not openings that serve the corridor **(SD). [MSBC 717.5.4.1 Exception 2]** |
| **Fire Partitions** | Required | NR | 717.5.4 | Ductwork does not exceed 100 square inches, constructed of steel a minimum of 0.0217 inch in thickness, does not have openings that communicate with the corridor, installed above the ceiling, shall not terminate at a wall register in the fire resistance rated wall, 12-inch long by 0.060-inch-thick steel sleeve centered in each duct opening and secured by rectangle angles **(SD). [MSBC 717.5.4 Exception 3]** |

[1] **Fire barriers within the building will include:** Occupancy separations (if provided) and special use room enclosures.
[2] **Smoke barriers within the building will include:** Fire service elevator lobby separations.

### *Protected Vertical Openings*

Vertical openings through floors will be protected by fire-rated assemblies in accordance with MSBC Section 707.3. Vertical openings include exit stairs, elevator shafts, and mechanical shafts. Shafts and exit enclosures, other than *exit access stairways* complying with MSBC Section 1019.3 Item 4, will be enclosed with listed and approved shaft enclosure assemblies that provide a 2-hour fire-resistant rated noncombustible shaft assembly per MSBC Section 707.3, as the shafts will connect less than four (4) stories but penetrate 2-hour rated floor slabs (Type IB Construction). **Enclosed exit stairs within the building will be designed with 2-hour fire-rated separations.**

The floor openings requiring shaft protection will include, but are not limited to:

- Grease Ducts, Trash chutes and linen chutes
- Elevator Shafts
- Mechanical, electrical and plumbing shafts
- Exit Stairways, other than exit access stairways complying with MSBC Section 1019.3 Item 4.

Duct systems throughout the building that do not connect more than two (2) stories and are not required to be enclosed in shafts and are not required to be provided with smoke dampers, provided the annular space around the shaft is sealed with an approved material (MSBC, Section 714).

### *ATRIUM DESIGN*

The current Fuller School design includes a three (3) story opening in the center of the building, with numerous breakout spaces within the opening. As the opening connects more than two (2) stories, the space is considered an atrium and must be designed in accordance with MSBC Section 404. Atriums are only permitted to be installed in buildings provided with approved automatic sprinkler protection (MSBC 404.3). **The design for the smoke control system includes 240,000 CFM of mechanical exhaust through multiple exhaust points spaces between Levels 2 and 3. Louvers and doors will be provided on Levels 1, 2, and 3 to supply the make-up air for the smoke control system. It should be noted that the louvers on the exterior of the building are not considered dampers, thus are not required to be listed in accordance with UL 555. The topic of louvers requires further discussed with the City of Framingham.**

Section 404.5 requires a smoke control system to be installed in accordance with MSBC Section 909. The smoke control system can either be designed using natural or mechanical-ventilation but will require and engineering rational analysis to ensure adequate system performance. Equipment for the smoke control system must be provided with standby power. **The atrium will be provided with a smoke control system utilizing mechanical exhaust. Refer to Appendix A for the Smoke Control Rational Analysis report drafted by Howe Engineers for further clarification on the system design.**

Section 404.6 requires atrium spaces to be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 707. A fire barrier is not required to enclose an atrium space when one (1) of the following arrangements are met:

- A glass wall forming a smoke partition is provided and sprinklers are provided along both sides of the separation walls and doors. Sprinklers must be located between 4 and 12-inches away from the glass at intervals along the glass not more than 6-feet. The sprinkler system must be designed to wet all surface of the glass upon activation. The glass wall must be installed in a gasketed frame in such a manner that the framing deflects without breaking the glass before the sprinkler operates. Where glass doors are provided, they must be self or automatic-closing.
- A glass block wall assembly complying with section 2110 having a ¾-hour rating is provided.
- A fire barrier is not required when the design is accounted for in the design of the smoke control system.

**The atrium is not separated from the balance of the building with 1-hour construction. The geometry of the building is considered in the design of the smoke control system as discussed in the smoke control rational analysis attached as Appendix A of this document.**

**It should be noted that that the cafeteria and learning commons are located at the base of the atrium on Level 1 of the building. The current design for the spaces includes a permeable, mesh separation screen to be installed to separate the east and west sides of the atrium thus allowing school-related, and public events to occur simultaneously at the base of the atrium. Additionally, doors will be constructed in the north and south side corridors adjacent to the atrium to further separate the school and public event spaces. Each side (east and west) of the atrium will be provided with two (2) means of egress. As noted above, the mesh screen is permeable, thus will not impact the functionality of the smoke control system.**

Atrium interior finishes must be class B or higher, with no reduction for sprinkler protection (Section 404.8).

It should be noted that unique egress requirements exist for atrium spaces in Section 404.9. Exit access travel distance through the atrium, not at the level of exit discharge, must not exceed 200-feet within the bounds of the atrium. Refer to the means of egress section of this report for further information.

### *STAGE DESIGN*

The current Fuller School design includes a stage in the auditorium space on the First Floor. The requirements for stages are provided in MSBC Section 410. Section 410.3.1 requires stages to be constructed of materials as required for floors of the type of construction in which the stage is located. **As the building will be of Type IB Construction, the stage must be constructed of materials as required for floors.** In all types of construction, the finished floor must be constructed of wood or non-combustible materials. Openings through the stage floor must be equipped with tight-fitting, solid wood trap floors with approved safety locks.

Where the stage height is greater than 50-feet in height, all portions of the stage must be completely separated from the seating area by a proscenium wall with not less than a 2-hour fire-resistance rating extending continuously from the foundation to the roof (Section 410.3.4). Where a proscenium wall is required to have a fire-resistance rating, the stage openings must be provided with a fire curtain complying with NFPA 80, horizontal sliding doors complying with Section 716.5.2 having a fire protection rating of at least 1-hour, or an approved water curtain complying with section 903.3.1.1. **Based on the current set of drawings, the stage height is approximately 30-feet, thus a proscenium curtain is not required.**

Combustible scenery used in sets must meet the fire propagation performance criteria of Test Method 1 or 2, as appropriate of NFPA 701 in accordance with Section 806 of the International Fire Code.

It should be noted that the current stage design was measured to be approximately 1,560 square feet. Section 410.3.7 requires emergency ventilation for stages larger than 1000 square feet in floor area, or stages with a height greater than 50-feet. Ventilation must comply with Section 410.3.7.1 (roof vents) or 410.3.7.2 (Smoke control). **The stage will be provided with natural roof vents.**

Dressing and appurtenant rooms are required to be separated from the stage with rated construction in accordance with Section 410.5.1. Stages must be separated from dressing rooms, scene docks, workshops, storerooms and compartments appurtenant to the stage by fire barriers or horizontal assemblies. The fire-resistance rating must be 2-hour for stage heights greater than 50-feet, and not less than 1-hour for stage height of 50-feet or less. **As the stage is less than 50-feet in height, dressing rooms must be separated from the stage with 1-hour rated construction. Additionally, the AV rooms on the east and west sides of the stage will be provided with a 1-hour fire resistance rating.**

Stages must be provided with automatic sprinkler protection in accordance with Section 903.3.1.1. Sprinklers must be installed under the roof and gridiron and under all catwalks and galleries over the storage. Sprinklers must be installed in dressing rooms, performer lounges, and storerooms accessory to the stage (Section 410.7). Section 905.3.4 requires that stages greater than 1,000 square feet in area be provided with a Class III wet standpipe system with 1 ½-inch and 2 ½-inch hose connections on each side of the stage. **As the stage is greater than 1,000 square feet, it must be provided with a standpipe system as required by Section 905.3.4.**

It should also be noted that an accessible route must be provided to access the stage. **Refer to the accessibility section of this report for further clarification on the accessibility requirements associated with the auditorium space.**

# MEANS OF EGRESS SYSTEM DESIGN

## *GENERAL REQUIREMENTS*

### Occupant Load

The occupant load for each space within the Building is determined using the occupant load factors listed in MSBC Table 1004.1.2, as shown in the table below.

| OCCUPANT USE GROUP | OCCUPANT LOAD FACTOR PER PERSON |
|---|---|
| Classrooms | 20 square feet (net) per person or actual occupant load |
| Lab Classrooms | 50 square feet (net) per person |
| Unconcentrated Assembly Areas (Lounge, Collab, Cafeteria) | 15 square feet (net) per person |
| Office/Business | 100 square feet (gross) per person |
| Locker Rooms | 50 square feet (gross) per person |
| Athletic Facility (Gymnasium) | 50 square feet (gross) per person |
| Stage | 15 square feet (net) per person) |
| Fixed Seating (Auditorium) | Actual Number of Seats |
| Circulation Space | 100 square feet (gross) per person |
| Kitchen | 200 square feet (gross) per person |
| Storage, Mechanical, Electrical | 300 square feet (gross) per person |
| Bleacher Seating | 18-inches per occupant |

**Refer to the 90% CD Life Safety Drawings prepared by Howe Engineers for the occupant load of each floor of the proposed building**.

It should be noted that the design of the building entails classrooms with moveable partitions between individual rooms. As such, the calculated occupant load of individual classrooms does not represent the actual occupant load expected in each space. The life safety drawings depict an “actual” occupant load of 25-people per classroom, which includes students and staff members. **The approach of using a planned occupant load has been discussed and approved from the Authority Having Jurisdiction**. **The planned occupant load will be included on the certificate of occupancy for the building.**

**Number of Exit Access Doorways**

Section 1006.2.1.1 requires that three (3) or more exits be provided when a space has a calculated occupant load of 501 to 1,000 and four (4) exits are required when the occupant load is greater than 1,000 occupants. Section 1006.2.1 requires two exits for all areas exceeding the occupant load in table 1006.2.1. For an A-3/E occupancy, two exits are required if the occupant load exceeds 49 occupants or where the common path of travel exceeds 75 feet. In Group B occupancy areas, two exits are required if the occupant load exceeds 49 occupants or where the common path of travel exceeds 100 feet. Further, in Group S-1/S-2 occupancy areas, two exits are required if the occupant load exceeds 29 occupants or where the common path of travel exceeds 100 feet.

**It should be noted that the first-floor occupant load exceeds 1,000, thus requiring four means of egress. The auditorium and gymnasium space are provided with their own dedicated egress doors leading directly to the exterior. The occupant load of the main school area is provided with four means of egress by means of doors to the exterior, and two (2) interior atrium stairways. The tech maker space, fab lab, art room, and media room on the first floor are all provided with a single 36-inch door that leads directly to the exterior of the building. Occupants in these rooms are expected to egress directly to the exterior of the building and do not need to enter the main building in order to egress. As such, the remainder of the first floor only requires three (3) means of egress, served by the two primary egress stairs, and the open stair within the atrium bounds.**

It should be noted that the means of egress for unique spaces such as boiler rooms, furnace rooms, and refrigeration machinery rooms is governed by Section 1006.2.2. Boiler rooms, incinerator rooms, and furnace rooms require two (2) means of egress where the area of the space is over 500 square feet and any fuel-fired equipment exceeds 400,000 BTU input capacity (Section 1006.2.2.1). Where two means of egress are required, one (1) is permitted to be a fixed ladder or an alternating tread device. The exits must be remotely located at a distance equal to one-half the length of the maximum overall diagonal dimension of the room. Refrigeration machinery rooms larger than 1,000 square feet must have at least two (2) exits (Section 1006.2.2.2). All portions of the machinery rooms must be within 150-feet of an exit or exit access doorway. Doors must swing in the direction of egress travel regardless of the occupant load served.

The current egress strategy involves occupants on the first-floor egressing upwards one story to exit through the main entry doors on Floor 2. MSBC Section 1006.3 permits the path of egress travel to pass through one (1) adjacent story to reach an exit. Occupants from Floor 1 would only pass through one adjacent story to reach the main entrance to the building, thus the approach complies with Section 1006.3. It should also be noted that Section 404.9.3 permits the exit access travel distance to be through an atrium, provided that the total exit access travel distance through the actual atrium space is not greater than 200 feet. This section is complied with in the designed atrium.

### Arrangement of Means of Egress (MSBC Section 1007.1.1)

Where two (2) exits, or exit access doors are required from a space, they must be placed not less than one-third the overall diagonal distance of the space, measured in a straight line between the exit doors or exit access doors.

Where there are three (3) or more exits, or exit access doors, at least two (2) of the exits or exit access doors are required to meet the remoteness as defined above. The additional exits shall be located as remotely as possible. **The current arrangement of means of egress meets these criteria. The primary egress stairs are on opposite sides of the building, satisfying the one-third remoteness criteria.**

**It should be noted that the office suite on the south side of Level 2 requires two (2) means of egress based on the calculated occupant load of the space. The primary means of egress is by way of the door into the corridor on the north side of the space. The secondary means of egress is by way of a door on the south west side of the space which leads directly to an area of rescue assistance on the south side of the building. The exterior walkway is provided with sufficient width to accommodate two (2) wheelchairs side by side thus meets the requirements of 521 CMR. The egress approach for the office suite has been discussed and approved by the Authority Having Jurisdiction for the project.**

### Exit Capacities

The exits within the building will be designed using the exit capacity factors listed in MSBC Sections 1005.3.1 and 1005.3.2. The exit capacity for stairs is calculated at 0.2 inches per occupant, while all other means of egress are calculated at 0.15 inches per occupant as the building will be fully sprinklered and provided with emergency voice/communication capabilities (Section 1005.3). The minimum required clear width shall not be less than those outlined within other sections of this report, which have been excerpted in the table below for reference.

| LOCATION | EXIT CAPACITY NON-SPRINKLERED | MINIMUM REQUIRED CLEAR WIDTH |
|---|---|---|
| Stairways | 0.20 inches per person | 44 inches (MSBC Section 1011.2) |
| Doors | 0.15 inches per person | 32 inches (MSBC Section 1010.1.1) |

**Refer to the 90% CD Life Safety Drawings prepared by Howe Engineers for the egress capacity and exiting strategy of each floor level. As seen in the life safety drawings, the means of egress capacity exceeds the occupant load on all floors.**

## Exit Access Travel Distance (MSBC Section 1017)

The Travel distance for each of the occupancies will be in accordance with the requirements contained in MSBC Section 1017.2 and Table 1017.2. Refer to the Table below:

| OCCUPANCY | MAXIMUM ALLOWABLE TRAVEL DISTANCE (Sprinklered) |
|---|---|
| Group A, E, S-1 | 250 feet |
| Group B | 300 feet |
| Group S-2 | 400 feet |
| Atrium | 200 feet within atrium |

Exit access travel distance must be measured from the most remote point within a story along the natural and unobstructed path of horizontal and vertical egress travel to the entrance of an *exit* (MSBC Section 1017.3). Where an exit access stairway or ramp is used as part of the means of egress system, the travel distance along the exit access stairway or ramp must be included in the exit access travel distance measurement (MSBC Section 1017.3.1). The measurement along exit access stairways and ramps must comply with the following:

- Stairways: measurements must be made on a plane parallel and tangent to the stair tread and nosings in the center of the stair and landings.
- Ramps: measurement along ramps must be made on the walking surface in the center of the ramp and landing.

Note that an “exit” is defined by MSBC Section 202 as that portion of a means of egress system between the exit access and the exit discharge or public way. Exit components include exterior exit doors at the level of exit discharge, *interior exit stairways* and *ramps*, *exit passageways*, *exterior exit stairways* and *ramps* and *horizontal exits*.

As addressed in the atrium design section of this report, the travel distance within the atrium is governed by Section 404.9. Where the path of egress travel is not on a level of exit discharge (i.e. Floor 3), the portion of the total permitted exit access travel distance that occurs within the atrium must not exceed 200-feet (Section 400.9.3).

### Egress through Intervening Spaces (MSBC Section 1016.2)

Exit access from a room or space should not pass through an adjacent room or space, except where the room or area is accessory to the area being served. Exit access is not permitted to pass through kitchens, storerooms, restrooms, closets or other similar spaces. In addition, the exit access is not permitted to pass through rooms subject to locking.

### Common Path of Travel Limits (MSBC Table 1006.2.1)

Maximum common path of egress travel distance is limited based on individual occupancies as outlined below.

- Business and Storage Occupancies 100 feet
- Assembly / Educational occupancies 75 feet

**Common path of travel is less than 75-feet in the Fuller School and thus is compliant.**

### Dead End Corridor Limits (MSBC Section 1020.4)

Per MSBC Section 1020.4, where more than one exit or exit access doorway is required, the exit access must be arranged such that there is no dead ends more than:

- Assembly Occupancies 20 feet
- Business Occupancies 50 feet
- Storage Occupancies 50 feet
- Educational Occupancies 50 feet

Note that a dead-end corridor is not limited where the length is less than 2.5 times the minimum width of the dead end. **Dead ends in the building will not exceed 20-feet.**

### Exit Access Corridors (MSBC Section 1020)

Corridors used for the exit access portion of the means of egress will be constructed in accordance with the MSBC Section 1020. The exit access corridors will provide sufficient clear width to accommodate the number of occupants exiting through the corridor, but will never be less than 44 inches unless serving an occupant load of less than 50 people, in which case they can be 36 inches.

**Per MSBC Table 1020.1, as the building will be fully sprinklered, rated corridors are not required.**

**It should also be noted that corridors in Group E occupancies with greater than 100 occupants are required to be 72-inches in width (Section 1020.2).**

### Exit Stair Discharge

The MSBC requires 50-percent of the enclosed interior exit stairways discharge to the exterior of the building and through the atrium. The remainder of the enclosed interior exit stairways are permitted to discharge to interior lobbies and vestibules (MSBC Section 1028.1). **The primary egress stairs on the east and west sides of the building both discharge directly to the exterior on the first floor and thus are compliant.**

### Doors (MSBC Section 1010)

Doors throughout the building must comply with MSBC Section 1010.1.

1. Dimensional Requirements (MSBC 1010.1.1)
   - Minimum clear width: 32 inches
   - Maximum size of a door leaf: 48 inches
   - Minimum Clear Height: 6 feet – 8 inches
2. Doors shall be side-hinged swinging in all spaces except within storage areas.
3. Doors serving a space with 50 people or more are required to swing in the direction of egress travel towards the exit.
4. While opening, doors are not permitted to project more than 50 percent of the required clear width in an exit stair or exit access stairway at any moment during the swing when opening. In addition, doors, when fully open, are not permitted to project more than 7 inches into the required exit clear width

### Exit signage (MSBC Section 1013)

1. Exit signs must be provided in each room or space that requires more than one (1) exit or exit access.
2. Exit signs must be placed such that no point within an exit access corridor is more than 100 feet or the listed viewing distance of the sign, whichever is less, from the nearest visible sign.
3. Main exterior exit doors or gates which obviously and clearly are identifiable as exits are not required to be provided with an exit sign where approved by the building official.

4. Every exit sign and directional exit sign must have plainly legible letters not less than 6 inches high with the principal strokes of the letters not less than ¾ inch wide. The word “EXIT” must be in high contrast with the background and shall be clearly discernible when the exit sign illumination means is or is not energized. When an arrow is provided as part of the exit sign, the construction shall be such that the arrow direction cannot be readily changed.
5. Exit signs and exit directional signs can be externally or internally illuminated. The level of illumination at the sign’s surface must be no less than 5-foot candles.
6. Exit signs shall be illuminated at all times and connected to an emergency power source having a duration of not less than 90 minutes. Emergency power shall conform to the National Electrical Code (NFPA 70).
7. Exit signs must be provided within 18-inches of the floor in electric rooms if the electric room has over 1,200 amperes and is more than 6-feet wide. In addition, panic hardware should be provided from these spaces.
8. **The International Symbol of Accessibility must be included on exit signs at exits to grade.**
9. Directional signage indicating the location of other means of egress and in which are accessible means of egress must be provided at the following locations:
   a. At exits serving a required accessible space, but not providing an approved accessible means of egress.
   b. At Elevator Landings
   c. Within areas of refuge

## Means of Egress Lighting (MSBC Section 1008)

**Work areas will meet the following criteria as MSBC Section 1008 requires the following for means of egress lighting:**

- The means of egress, including the exit discharge, must be illuminated at all times the building space served by the means of egress is occupied, except aisle access ways in Group A occupancies.
- The means of egress illumination level must not be less than 1 foot-candle (11 lux) at the walking surface.
- The power supply for means of egress illumination must normally be provided by the premises' electrical supply. In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:
    - Aisles and unenclosed egress stairways in rooms and spaces that require two or more means of egress.
    - Corridors, exit enclosures and exit passageways in buildings required to have two or more exits.
    - Exterior egress components at other than their levels of exit discharge until exit discharge is accomplished for buildings required to have two or more exits.
        - All components to the access to public way must be illuminated
    - Interior exit discharge elements, as permitted in Section 1027.1 of the MSBC, in buildings required to have two or more exits.
    - Exterior landings as required by Section 1008.1.6 for exit discharge doorways in buildings required to have two or more exits.
- The emergency power system must provide power for a duration of not less than 90 minutes and must consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system must be in accordance with Chapter 27 of the MSBC.
- Emergency lighting facilities must be arranged to provide initial illumination that is at least an average of 1 foot-candle (11 lux) and a minimum at any point of 0.1 foot-candle (1 lux) measured along the path of egress at floor level. Illumination levels are permitted to decline to 0.6 foot-candle (6 lux) average and a minimum at any point of 0.06 foot-candle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 must not be exceeded.

# FIRE PROTECTION SYSTEMS

### *SUMMARY OF FIRE PROTECTION FEATURES*

*The following Fire Protection and Life Safety Features are being provided in the building:*

1. The building will be constructed of a Type IB fire resistive non-combustible construction.
2. The building will be fully sprinklered and provided with standpipes as outlined in this section.
3. A manual fire alarm system will be provided in the building and will meet current NFPA 72 spacing requirements
4. Emergency voice/alarm communication systems will be installed in accordance with Section 907.2.3
5. Emergency Power and Standby Power for all life safety systems
    a. At least one elevator will be available to operate on Standby power
    b. Egress Signage and Lighting will be provided with Emergency Power.
    c. The atrium smoke control system will be provided with Standby Power.
6. Portable fire extinguishers are being provided in supervised locations in accordance with NFPA 10.
7. The system will be zoned relative to an atrium zone and non-atrium zone.

### *AUTOMATIC SPRINKLER PROTECTION*

The Fuller School will be provided with an automatic sprinkler system as required for Group E occupancies with fire areas larger than 12,000 square feet and as required by the M. G. L. 148 26 G. The atrium and stage are also required to be provided with sprinkler protection. The design densities of the sprinkler system will be determined by the engineer of record.

**It should be noted that the auditorium on Level 1 of the building is currently designed with cloud ceilings below the roof of the space. The cloud ceilings are constructed of wood, thus the ceilings are combustible. The sprinkler approach for the cloud ceiling involves providing sprinklers above and below the clouds to ensure adequate performance of the sprinkler system with respect to the clouds and to the areas below the cloud ceilings. The design complies with the current MSBC and NFPA 13 and will be further discussed by Framingham Fire Department. As the cloud ceilings are provided with sprinkler protection above and below, they are permitted to be Class A, B, or C interior finish in accordance with MSBC Section 803.13.2 (below)**

**803.13.2 Set-out construction.** Where walls and ceilings are required to be of fire-resistance-rated or noncombustible construction and walls are set out or ceilings are dropped distances greater than specified in Section 803.13.1, Class A finish materials, in accordance with Section 803.1.1 or 803.1.2, shall be used.

**Exceptions:**

1. Where *interior finish* materials are protected on both sides by an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Where *interior finish* materials are attached to noncombustible backing or furring strips installed as specified in Section 803.13.1.1.

***STANDPIPES***

Standpipes are required throughout the building when the highest floor is greater than 30 feet above the lowest level of fire department access (MSBC Section 905). **Based on the building elevation drawings provided by JLA, the building height from the lowest level of fire department vehicle access to the highest occupiable floor is 28-feet. It should be confirmed by JLA that the lowest level of fire department access is the first floor and that the landscape around the building is not sloped to provide fire department access at a lower point. It should be noted that Class I standpipes are permitted in buildings provided with automatic sprinkler protection in lieu of a Class III standpipe.**

It should also be noted that the stage will require a Class III wet standpipe system with a 1 ½-inch hose connection installed in accordance with NFPA 13 or NFPA 14 on each side of the stage (Section 905.3.4). This requirement is applicable as the stage is greater than 1,000 square feet in area.

***FIRE ALARM***

Section 907.2.3 requires a manual fire alarm system for group E occupancies having an occupant load that exceeds 50. The manual fire alarm system must initiate emergency voice/alarm communication features in the building. Where smoke detectors or automatic sprinkler systems are installed, the systems must be connected to the building fire alarm system. **It should be noted that manual fire alarm boxed are not required in Group E occupancies where the building is fully sprinklered, the emergency voice/alarm communication system will activate upon sprinkler waterflow, and where manual activation is provided from normally occupied spaces.**

## Manual Fire Alarm Pull Stations

Manual fire alarm devices will be located no more than five (5) feet from the entrance to each exit. Additional manual fire alarm boxes will be located so that travel distance to the nearest box is no more than 200 feet. A Manual pull station will also be provided in a constantly attended locations to provide the capability to manually activate the fire alarm system in an emergency situation.

***SMOKE CONTROL***

As indicated in the atrium design section of this report, the atrium will require a smoke control system designed in accordance with MSBC Section 909. The system may be designed as either a natural or mechanical ventilation system, and an engineering rational analysis should be provided to document the intended design of the system function. A smoke control panel must be provided in accordance with MSBC Section 909.16. As indicated throughout this report, the smoke control system must be provided with standby power.

**Refer to Appendix A for the atrium Smoke Control Rational Analysis.**

***EMERGENCY POWER***

The following systems shall be provided with emergency power:

1. Emergency lighting along the means of egress in the building and along the exit discharge at a minimum level of 1-foot candle. Emergency lighting shall be provided in those rooms when the area is occupied. Subject to the approval of the Authorities Having Jurisdiction.
    a. Complete Emergency Lighting shall be provided to the exit discharge of the building exits as determined by the Authorities Having Jurisdiction.
2. Fire Alarm System and all associated equipment including but not limited to the following:
    a. Fire alarm control panels (including all fire alarm control equipment throughout the facility).
    b. Fire alarm controls.
    c. Fire alarm power supply booster panels.
    d. Digital fire alarm communicators and interface equipment.
    e. Dedicated telephone line from the Fire Alarm Control Panel dialer.
    f. Manual pull stations
3. Exit and Directional Exit Signs.
4. Elevators (transferable)
5. Power Operated Locks (if provided)
    a. Manual override controls for any electric locking or hardware in the entire building.

It should be noted that the atrium smoke control system will be required to be provided with standby power.

***ELEVATOR PROVISIONS***

An elevator is proposed in the southwest portion of the building which will serve the first through the third floor and will provide roof access.

Phase I and Phase II recall equipment prescribed by the ASME 17.1 elevator code will be provided for the elevators. Accessible elevators shall be located with the required travel distance as per the Accessibility Standards.

**Two-way communication devices must be provided at elevator lobby areas above grade (i.e. second and third floors).**

**It should be noted that the elevator machine room will require a fire-resistance rating matching the rating of the elevator shaft. This rating must be provided where openings are provided from the elevator machine room into the elevator shaft as the machine room directly abuts the elevator shaft. The elevator machine room is currently designed with openings into the elevator shaft, thus the machine room will be provided with a 2-hour rating to match the rating of the elevator shaft.**

***PORTABLE FIRE EXTINGUISHERS***

The Massachusetts State Fire Code (MSFC) adopts and amends the 2015 edition of NFPA 1, which requires fire extinguishers in Groups A, B, and E occupancies. As such, fire extinguishers must be provided throughout all enclosed areas of the building. Portable fire extinguishers will be provided in locations where required by NFPA 10. Basic requirements are as follows.

In accordance with MSBC Section 906.1, extinguishers will be required in the following locations:

- Not more than 75 feet of travel distance to a fire extinguisher. Fire Extinguishers need not be located in each room if the travel distance can be achieved and the extinguisher has the correct hazard classification for each hazard within the 75-foot travel distance.
- Portable Class BC in elevator machine rooms and kitchens (kitchens may require class K depending on contents and use)
- Shall not exceed 40 lbs. capacity

## Actual Mounting Locations (2013 Edition NFPA 10)

- Bottom of extinguisher at least 4" above the floor
- Top of extinguisher not more than 5 ft. above the floor
- 1-6.6 Fire extinguishers shall not be obstructed or obscured from view
- 1-6.5 Cabinets shall not be locked (However, if extinguishers are in locations subject to malicious use, the cabinets can be locked, but there must be a means to open them in an emergency. Example: breaking the glass)
- 1-6.3 Fire extinguishers shall be conspicuously located where they will be readily accessible and immediately available in the event of a fire. Preferably they shall be located along normal paths of travel, including exits from areas.
- 1-6.11 Operating instruction shall be located on the front of the extinguisher and be clearly visible (manufacturer requirement)
- 1-6.12 Fire extinguishers mounted in cabinets or wall recesses shall be placed so that the fire extinguisher operating instructions face outward.
- The location of such fire extinguishers shall be marked conspicuously (see 1-6.6)

### *FIRE DEPARTMENT ACCESS*

Per 527 CMR Section 18.2.3.2, a fire department access road must be maintained / provided in a manner that allows for at least one (1) exterior door to be within 50 feet of the access road that can be opened from the outside. In addition:

- All points of the building must be within 150 feet of the fire department access road which is increased to 250 feet when the building is protected throughout by an automatic sprinkler system.
- The fire department access road must have an unobstructed width of not less than 20 feet, and an unobstructed vertical clearance of 13 feet 6 inches.
- A minimum 25-foot turning radius must be provided / maintained.
- The access road must be designed and maintained to support the imposed loads of fire department apparatus and must be provided with an all-weather driving surface.
- Turning radius must be approved by the AHJ, with a minimum turning radius of 25 feet.
- Where necessary, dead ends are permitted provided they do not exceed 150 feet in cumulative length.
- The access road plan must include an analysis and evaluation of fire apparatus maneuvers throughout the access roads created by sweep path analysis and turn simulation software.

### *EMERGENCY RESPONDER RADIO COVERAGE*

Per the MSBC Section 916.1, all buildings must have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section does not require improvement of the existing public safety communication systems. The emergency responder radio coverage must be in accordance with Section 510 of the International Fire Code.

The building is considered to have acceptable emergency responder radio coverage when signal strength measurements in 95 percent of all areas on each floor of the building have a minimum signal strength of -95 dBm must be receivable within the building and a minimum signal strength of -100 dBm must be received by the agency's radio system when transmitted from within the building. **A bi-directional antenna should be provided for the project. Further discussion with Framingham is required to determine the number of antennas needed for Fire, Police and EMS.**

# ACCESSIBILITY

As a new construction building, the Fuller School will be designed to be fully accessible and comply with MAAB as well as the 2010 Americans with Disabilities Act.

### *GENERAL REQUIREMENTS*

The Fuller School must be designed to meet MAAB as well as the 2010 Americans with Disabilities Act. Both ADAAG and MAAB require that all entrances are accessible, changing rooms and showers are accessible, and that all bathrooms be designed to be accessible. Finally, it should be noted that MAAB requires all exterior pathways to be fully accessible and that if parking is provided that a certain percentage be accessible.

The following accessible features should be provided in the building.

- All bathrooms and locker rooms should be accessible. Locker rooms should include the following features:
    - 36-inch wide accessible routes around all lockers. (including between benches and lockers)
    - 5% but not less than one accessible locker. 36″ wide space should be provided between benches and lockers
    - At least one accessible shower stall
    - Accessible toilet and plumbing fixtures
- The elevator will be fully accessible and meet gurney requirements
- All entrances must be accessible
- All exterior walkways must be accessible
- Classrooms must be accessible including all laboratory/ science classrooms. 5% but not less than one (1) of each type of equipment/ learning station should be accessible
- All exterior paths should be accessible

### *Public and Common Use Spaces*

The public and common use spaces are those spaces inside or outside the buildings that are used by residents and/or visitors. This includes the parking and assembly spaces on the ground floor. These spaces must be accessible per the requirements of 521 CMR and the 2010 ADAAG. These spaces should be on an accessible route at least 36- inches wide which connects accessible parking, accessible entrances, and public and common use spaces. Wherever possible, the accessible route should be the shortest possible route (521 CMR 10.2). All doorways and openings located in common use and public use spaces and along accessible routes should comply with 521 CMR Sections 26.2 through 26.11 and ADAAG Section 404.

### *Accessible Means of Egress*

All spaces or elements that are required to be accessible must be provided with at least one accessible means of egress. In spaces required to be provided with multiple means of egress, each space must be served by at least two accessible means of egress. Exit access stairways are permitted to be considered part of the accessible means of egress when they are provided with a clear width of at least 48 inches between the handrails and two-way communication is provided at the elevator landings in accordance with 780 CMR Section 1009.3. The building is fully sprinklered and areas of refuge are not required to be provided at the exit access stairways. Two-way communication is required to be provided at the elevator landings, so that the exit access stairways in the school can be considered as part of the accessible means of egress.

### *Parking*

Parking will be provided in accordance with the following MAAB table based on the number of spaces provided for the residential occupants and the potential assembly occupants. **One in eight accessible spaces, but not less than one, must be van accessible.**

| 23.2.1 | Total Parking in Lot | Required Minimum Number of Accessible Spaces |
|---|---|---|
| | 15-25 | 1 |
| | 26-50 | 2 |
| | 51-75 | 3 |
| | 76- 100 | 4 |
| | 101-150 | 5 |
| | 151-200 | 6 |
| | 201-300 | 7 |
| | 301-400 | 8 |
| | 401-500 | 9 |
| | 501-1,000 | 2% of total |
| | 1,001 and over | 20 plus 1 for each 100 over 1000 |

### *Accessible Seating Requirements*

In places of assembly with fixed seating, the minimum number of accessible spaces provided must be in accordance with the table below:

| Total Seating | Wheelchair Spaces |
|---|---|
| 4 to 25 | 1 |
| 26 to 50 | 2 |
| 51 to 300 | 4 |
| 301 to 500 | 6 |
| over 500 | 6, one additional space for each total seating capacity increase of 100. |

When more than 150 seats are provided, the wheelchair seating locations must be provided in more than one (1) location and must be dispersed through the seating area. Accessible seating must be integral with the rest of the seating (i.e. shoulder to shoulder). Bleachers should be ordered with cutouts where accessible seating will be provided.

It should also be noted that ADAAG requirements will be applicable to the project. ADAAG Table 221.2.1.1 also requires six (6) wheelchair spaces to be provided in the auditorium as the space will have 412 fixed seats.

In addition to wheelchair seating locations, 1% of all fixed seats must be a companion seat consisting of an aisle seat with no armrests on the aisle side (or with removable or folding armrests on the aisle side).

Accessible seating positions are permitted to be clustered for bleachers, balconies and other areas having sight lights with a slope greater than 5%. Equivalent accessible viewing positions may be located on levels having accessible egress.

Ticket box offices and concession stands must be located on an accessible route, and a portion of the counter must be a maximum of 36 inches high for a length of at least 36 inches. A counter or auxiliary counter can be used to achieve this requirement.

**It should be noted that accessible seating must be provided in both the auditorium and the gym, which is provided with telescoping bleacher seating. The auditorium is provided with 412 fixed seats, thus must be provided with six (6) wheelchair seats (with a companion seat directly adjacent to the wheelchair space). The gymnasium must be provided with cutout sections in the telescoping seating to accommodate wheelchair spaces.**

**Additionally, within the auditorium spaces, assistive listening devices must be provided**. Assembly areas that accommodate at least 50 persons or with an audio-amplification systems must be provided with permanently installed assistive listening systems (521 CMR 14.5.1). If the assistive listening system serves individual fixed seats, such seats must be located within a 50-foot viewing distance of, and including the stage, and must have a complete view of the stage (521 CMR 14.5.3). Signage must be provided to notify patrons of the availability of a listening system and must comply with the signage provisions of 521 CMR 41.00.

**An accessible route must be provided to the performance area within the auditorium.**

**Where classrooms are provided with fixed seating, at least 5% but not less than one will be provided with an accessible route, accessible clear floor space, knee clearance, and table heights.**

## PLUMBING FIXTURES

The Massachusetts Plumbing Code requires specific plumbing fixtures for various spaces in the building. The number of plumbing fixtures shall be determined based on the following factors, as excerpted from the Massachusetts State Plumbing Code, Section 10.10 Table 1.

The following table outlines the plumbing fixture requirements for new construction. The factors that dictate the fixture counts for the building depend on the intended and future function of the Fuller School. It should be noted that separate toilet facilities are required for staff and students.

| Occupancy | Water closets | | | Lavatories | | Drinking Fountains | Other Fixtures |
|---|---|---|---|---|---|---|---|
| | Male | Female | Urinals | Male | Female | | |
| Education (Secondary) | 1 per 90 | 1 per 30 | 1 per 90 | 1 per 90 | 1 per 90 | 1 per 75 | 1 service sink per floor |
| Education (Staff) | 1 per 25 | 1 per 20 | 33% substitution | 1 per 40 | 1 per 40 | - | 1 service sink per floor |
| Auditorium | 1 per 600 seats | 1 per 200 seats | 1 per 200 seats | - | - | - | - |

The following tables outline the required plumbing fixtures for the Fuller School based on the use of a programmatic occupant load. A program occupant load captures the intended use of spaces, as opposed to the calculated occupant load which tends to be more conservative in nature. **The use of a program occupant load requires discussion and approval from the plumbing official**.

Gender neutral toilets have been discussed for the building. The following provisions are applicable for the installation of gender-neutral toilets in the Fuller School:

1. Gender neutral facilities are permitted for employees
2. Gender neutral toilets can only be counted one time towards plumbing fixture counts. Thus, they may be counted as either Male or Female.
3. When two (2) or more toilet facilities are required, Gender Neutral Toilets may replace these fixtures but only in pairs (E.g. one replaces a Male and the other replace a female fixture).
4. Once the minimum number of fixtures is provided Gender Neutral Toilets can be singularly provided.

**It should also be noted that 248 CMR Section 10.10(18)(h).6 requires all secondary schools that conduct physical activities on the school premises to be provided with separate men's and women's shower facilities to accommodate students. Based on preliminary discussion with the plumbing official, showers will be required at Framingham Fuller School. Showers should be provided for the largest population expected to use them at a given time (e.g. physical education class, or after school sporting event).**

## Fuller Plumbing Fixtures Calculation

630 Students  120 Staff

### Educational Use - Use Group E (elementary)

| Required Fixtures per Code | | | | | | Toilet Female Required | | Toilet Male Required | | Urinals Male Required | | Lavatories each sex Required | | | Drinking Fountain Required |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Students | | | | | | 1 per 30 | | 1 per 90 | | 1 per 90 | | 1 per 90 | | | 1 per 75 |
| Staff | | | | | | 1 per 20 | | 1 per 25 | | 33% | | 1 per 40 | | | - |

| | Occupants | | | Unisex Toilet | | Toilet - Female | | Toilet - Male | | Urinals | | Lavatories | | | Drinking Fountain | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Floor Level | Total | Male | Female | Required | Provided | Required | Provided | Required | Provided | Required | Provided | Each sex Required | Female Provided | Male Provided | Required | Provided | Classrm Sinks | Showers | Mop Sinks | Notes |
| | | | | | See Below | | | | | | | | | | | | | | | |
| Floor 1 Students | 210 | 105 | 105 | 0 | 1 | 4 | 12 | 2 | 5 | 2 | 7 | 2 | 11 | 11 | 3 | 3 | | | | |
| Floor 1 Staff | 40 | 20 | 20 | 0 | 13 | 1 | - | 1 | - | 1 | | 1 | 1 | 1 | - | - | | | 3 | |
| Floor 2 Students | 210 | 105 | 105 | 0 | 1 | 4 | 8 | 2 | 2 | 2 | 6 | 2 | 8 | 8 | 3 | 3 | | | | |
| Floor 2 Staff | 50 | 25 | 25 | 0 | 3 | 2 | - | 1 | - | 1 | | 1 | 1 | 1 | - | - | | | 2 | |
| Floor 3 Students | 210 | 105 | 105 | 0 | 1 | 4 | 8 | 2 | 2 | 2 | 6 | 2 | 8 | 8 | 3 | 3 | | | | |
| Floor 3 Staff | 30 | 15 | 15 | 0 | 2 | 1 | - | 1 | - | 1 | | 1 | 1 | 1 | - | - | | | 2 | |
| | 750 | 375 | 375 | 0 | 21 | 16 | 28 | 9 | 9 | 9 | 19 | 9 | 30 | 30 | 9 | 9 | 0 | 0 | 7 | |

Unisex Toilets provided:

Students 3 SPED
1 at Lockers

Staff 1 Central Office
1 Medical Suite
1 Kitchen
6 General

**Total Toilet Fixtures Required** 34

**Total Toilet Fixtures Provided** 77

### Community Service Areas - Use Group E - Non-Simultaneous Use

420 Auditorium, 600 Gym

| Required Fixtures per Code | Toilet Female Required | | Toilet Male Required | | Urinals Male Required | |
|---|---|---|---|---|---|---|
| | 1 per 200 | | 1 per 600 | | 1 per 200 | |

Assembly Use

| Floor Level | Occupants Total | Occupants Male | Occupants Female | | | Toilet Female Required | Toilet Female Provided | Toilet Male Required | Toilet Male Provided | Urinals Male Required | Urinals Male Provided | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |
| Floor 1 | 1,020 | 510 | 510 | | | 3 | 7 | 1 | 2 | 3 | 5 | Plus 2 Unisex |
| | | | | | | | | | | | | |
| | | | | | | 3 | 7 | 1 | 2 | 3 | 5 | |

**Total Toilet Fixtures Required** 7

**Total Toilet Fixtures Provided** 14  17 With Unisex

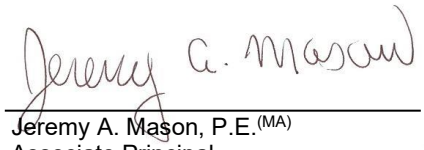
## CONCLUSION

The building is to be constructed in accordance with the requirements of the applicable Codes. During this process, the building will be designed to provide levels of safety at least equivalent to the provisions contained in the applicable codes. To achieve these levels of safety, the following primary features are provided:

1. The Building will be of Type IB fire resistive non-combustible construction and will comply with the separated mixed-use provisions of the MSBC.
2. The building will be fully sprinklered and provided with standpipes as outlined herein.
3. The means of egress system will be provided as outlined in this report and will meet the requirements of MSBC.
    a. Classrooms are proposed to use the actual number of students/ staff as opposed to the calculated occupant load.
    b. Open stairs will be used as part of the exit access as permitted by Chapter 10 of the MSBC.
4. The building will be provided with a manual fire alarm system and emergency voice/alarm communication abilities.
5. The atrium will be provided with a smoke control system that maintains tenability 6-feet above the highest walking surface. The smoke control system will be provided with standby power.
6. The building will be designed to be fully accessible in accordance with MAAB and ADAAG.
7. Plumbing fixtures will be provided in accordance with the provisions in the tables detailed above.

Prepared by,

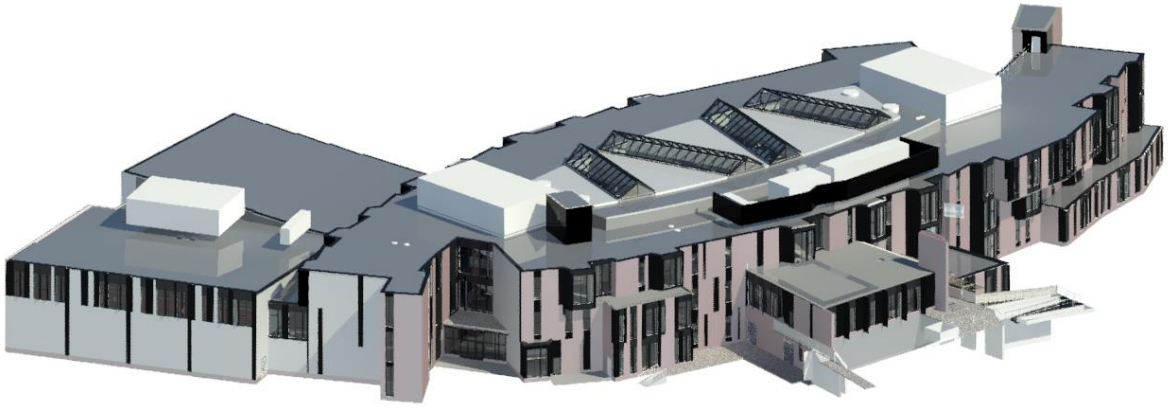
Howe Engineers, Inc.



Jeremy A. Mason, P.E.(MA)
Associate Principal

# APPENDIX A: SMOKE CONTROL BASIS OF DESIGN

# SMOKE CONTROL RATIONAL ANALYSIS



## FRAMINGHAM FULLER MIDDLE SCHOOL

**FRAMINGHAM, MA**

Prepared for:


Jonathan Levi Architects
266 Beacon Street
Boston, MA 02116


Prepared by:


101 Longwater Circle, Suite 203
Norwell, MA 02061
Phone: 781.878.3500
Fax: 781.878.3551



**SUBMITTED**: OCTOBER 15, 2019


**Smoke Control System Design**

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## PURPOSE

This report presents the design concept for the smoke control system provided within the Framingham Fuller Middle School in Framingham, Massachusetts, which will include a three (3) story atrium that connects the First Floor through Third Floor. The basis of this analysis represents the requirements of the Massachusetts State Building Code (MSBC), which is based on the International Building Code (IBC). The proposed smoke control system design will utilize the large smoke-filling reservoir (i.e., passive system) along with mechanical exhaust systems to maintain tenability 6 feet above the highest means of egress walking surface open to the atrium. The proposed design will be evaluated using a Computational Fluid Dynamics (CFD) model, known as Fire Dynamic Simulator (FDS), to demonstrate the design concepts of the smoke control system are compliant with the applicable codes.

## APPLICABLE CODES AND STANDARDS

The following codes and standards are currently applicable to this project:

- 780 CMR Massachusetts State Building Code (MSBC), 9th Edition
    - 2015 International Building Code (IBC), with state amendments
    - 2015 International Mechanical Code (IMC), with state amendments
- Massachusetts Fire Prevention Code
    - 2015 Edition of NFPA 1, *The Fire Code*, with state amendments

Reference Standards from the Massachusetts State Building Code:

- 2015 Edition of NFPA 92, *Standard for Smoke Control Systems*
- 2009 Edition of NFPA 92B, *Standard for Smoke Management Systems in Malls, Atria and Large Spaces*

## PROJECT DESCRIPTION

The Design Team is proposing a design for a new middle school located in Framingham, MA. The proposed building will be a newly constructed, three (3) story building with a footprint area of approximately 64,780 square feet. The building contains primarily Group E Educational spaces for middle school students ($6^{th}$ to $8^{th}$ grade), with accessory office and lounge spaces. There is a gymnasium and auditorium on the north side of the building that will be considered Group A-3 assembly spaces as public events will likely be held in these spaces. Floors 1 and 2 serve as the primary circulation levels and provides the exits and entrances to the building. The floor levels of the project are described as follows:

| Floor Level | Description |
|---|---|
| **Floor 1** | Classrooms, Lab Spaces, Gymnasium, Auditorium, Lounges, Offices, Storage, MEP |
| **Floor 2** | Classrooms, Lounges, Offices, Storage, MEP |
| **Floor 3** | Classrooms, Lounges, Offices, Storage, MEP |

## DESIGN OBJECTIVE

The design objective of this analysis, is to demonstrate compliance with the intent of the Building Code utilizing the natural smoke filling space and mechanical smoke control system to maintain tenable conditions along the means of egress during a fire event for a minimum of 1.5 times the required safe egress time, or 20 minutes, whichever is greater (MSBC Section 909.4.6). A tenable environment must be maintained at least 6 feet above any walking surface that forms a portion of the required means of egress system when traveling through the atrium spaces that are not intimate with fire ignition (MSBC Section 909.8.1).

## METHODOLOGY

In order to demonstrate code compliance, the smoke control system must be evaluated using an engineering analysis that addresses characteristics of fuel load, separation requirements, heat release rates, and sprinkler effectiveness (MSBC Sections 909.4 and 909.8). In addition to these elements, this smoke control design will also utilize additional requirements as laid out by NFPA 92 Standard for Smoke Control Systems, and ASHRAE “Design of Smoke Management Systems” where not specifically addressed by the Building Code.

The ASHRAE “Design of Smoke Management Systems” manual and most recognized Building Codes indicate that effective smoke control design recommends multiple design approaches for large volume spaces when designing an effective system. These primary design approaches are:

1. Utilizing the large-volume space as a smoke reservoir and modeling smoke layer descent to determine if occupants are able to egress the space before they are exposed to smoke.
2. Removing the smoke in the large-volume space using a mechanical exhaust system sufficient to maintain the smoke layer interface at a predefined height for an indefinite period of time.
3. Removing smoke from the large-volume space, using a mechanical exhaust capacity that slows the rate of smoke layer descent for a period that allows occupants to safely egress the space.
4. Providing natural venting sufficient to maintain the smoke layer interface at a predefined height for an indefinite period of time.

5. Providing natural venting sufficient to slow the rate of smoke layer descent for a period that allows occupants to safely egress the space.

To provide a comprehensive and conservative design basis, the smoke control system will utilize the inherent large-volume space (Item 1 above) of the atrium skylight to provide a smoke reservoir which will aid the mechanical smoke control system (Item 2/3 above) to maintain tenability for a minimum of 1.5 times the calculated required safe egress time, or 20 minutes after detection, whichever is greater (MSBC Section 909.4.6).

NFPA 92, Section 5.1 provides a number of methods to justify the smoke control design approach chosen above, including basic algebraic calculations, compartment fire models, scale modeling, and zone models. NFPA 92 recommends computational fluid dynamics (CFD) modeling when evaluating complicated building geometries such as overhangs, pitched ceiling structures, and mesh ceiling structures causing smoke to spill to adjacent occupiable spaces.

#### *CFD MODELING*

A Computational Fluid Dynamics (CFD) model is used to evaluate the design fire scenarios within the Atrium Zone of the Framingham Fuller Middle School. CFD computer modeling is an advanced modeling method that is capable of predicting realistic heat and fluid flow through a space. The model consists of dividing a volume into a large number of small cubes (usually thousands or millions) and solving the fundamental conservation equations to calculate the movement of heat and mass across each cube as a function of time. The fundamental conservation equations include mass, energy, and momentum.

For the purposes of this analysis, a CFD modeling program called Fire Dynamics Simulator (FDS), Version 6.6.0, developed by the National Institute of Standards and Technology (NIST), will be used. This model has been developed for use in low speed transport of heat and combustion products from fire, as well as radiative and convective heat transfer between gas and solid surfaces. Further, the model has been verified for this type of application as indicated in the references provided in NFPA 92 Section A5.1.3. This model is available online at www.fire.nist.gov.

#### DESIGN ASSUMPTIONS

For the purpose of this analysis, it is not practical to evaluate all conditions for every possible fire scenario. Therefore, several assumptions had to be made to complete this analysis for a realistic worst-case scenario. These assumptions include design fire location, size and configuration, selection of tenability criteria (products of combustion) to evaluate, and tenability thresholds (or failure points). This section of the report is intended to address each of the assumptions in detail.

When sprinklers are provided in the location where the design fire is located, NFPA 92, Section A5.2.1 indicates that the heat release rate and growth of the fire is likely to be decreased or maintained at the value that the fire has reached when sprinklers activate. When applicable, fire sizes will be determined by the sprinkler effectiveness in accordance with MSBC Section 909.9.4.

In accordance with the requirements of the MSBC and NFPA 92, this analysis only contemplates one fire at one location within the building at a time for the design of the smoke control system. Multiple simultaneous fires at multiple locations are not contemplated, nor required to be contemplated by the adopted codes and standards.

***SMOKE CONTROL CONFIGURATION***

The building's smoke control system will utilize the exhaust method in accordance with MSBC Section 909.8. The system is comprised of mechanical exhaust fans for exhausting, and automatic-opening doors and louvers for supplying makeup air to maintain a tenable environment six (6) feet above all walking surfaces within the Atrium Zone.

**EXHAUST CONFIGURATION**

The proposed smoke control scheme provides a total of 240,000 cubic feet per minute (CFM) of mechanical exhaust. This is achieved via the exhaust points located at the ceiling of the atrium above the Third-Floor walking surface and located at the ceiling above the Second-Floor walking surface. Refer to Figure 1 and Figure 2 for a diagram of the exhaust configuration.

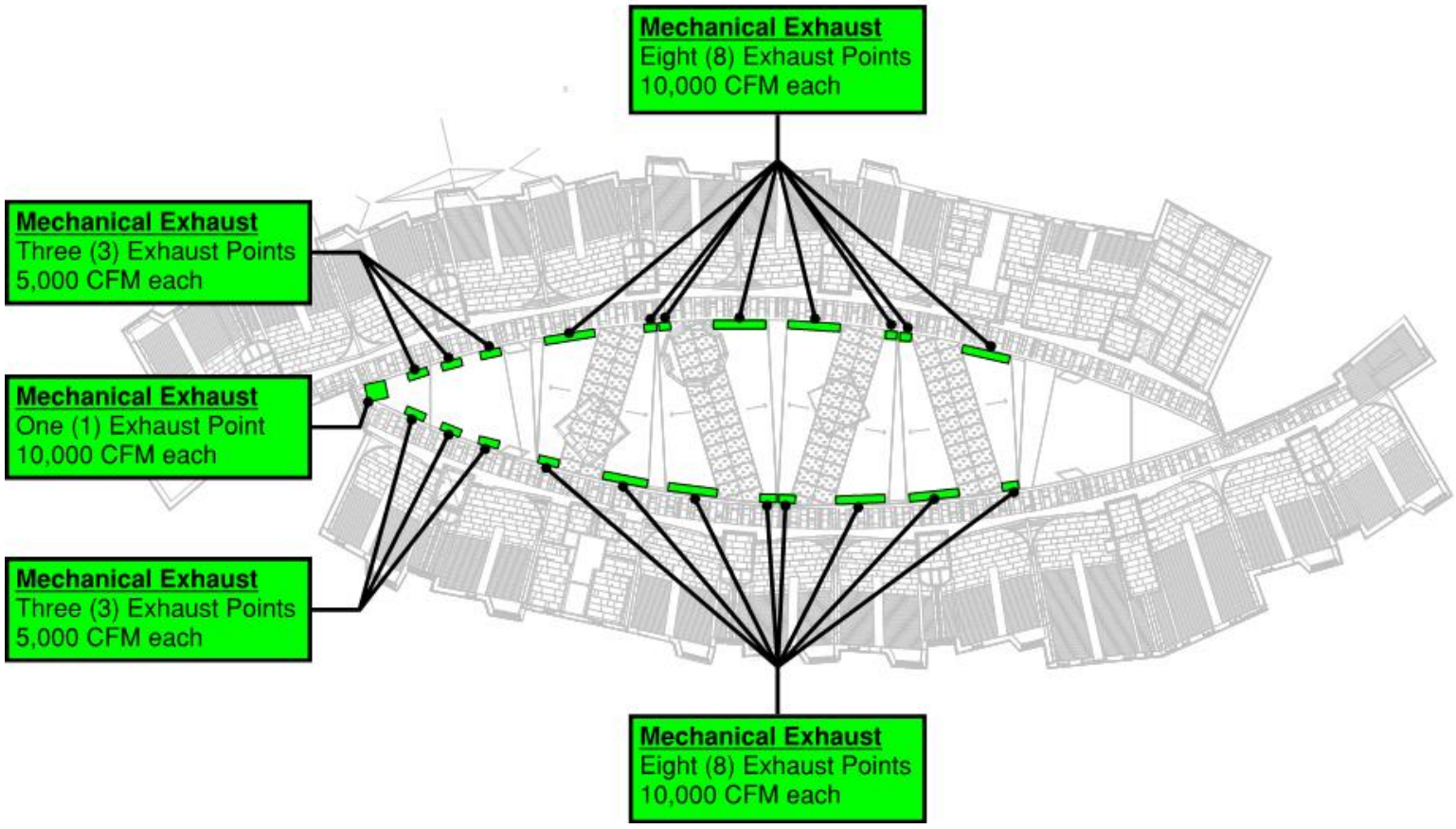


**Figure 1: Smoke Exhaust Configuration (RCP Floor 3)**

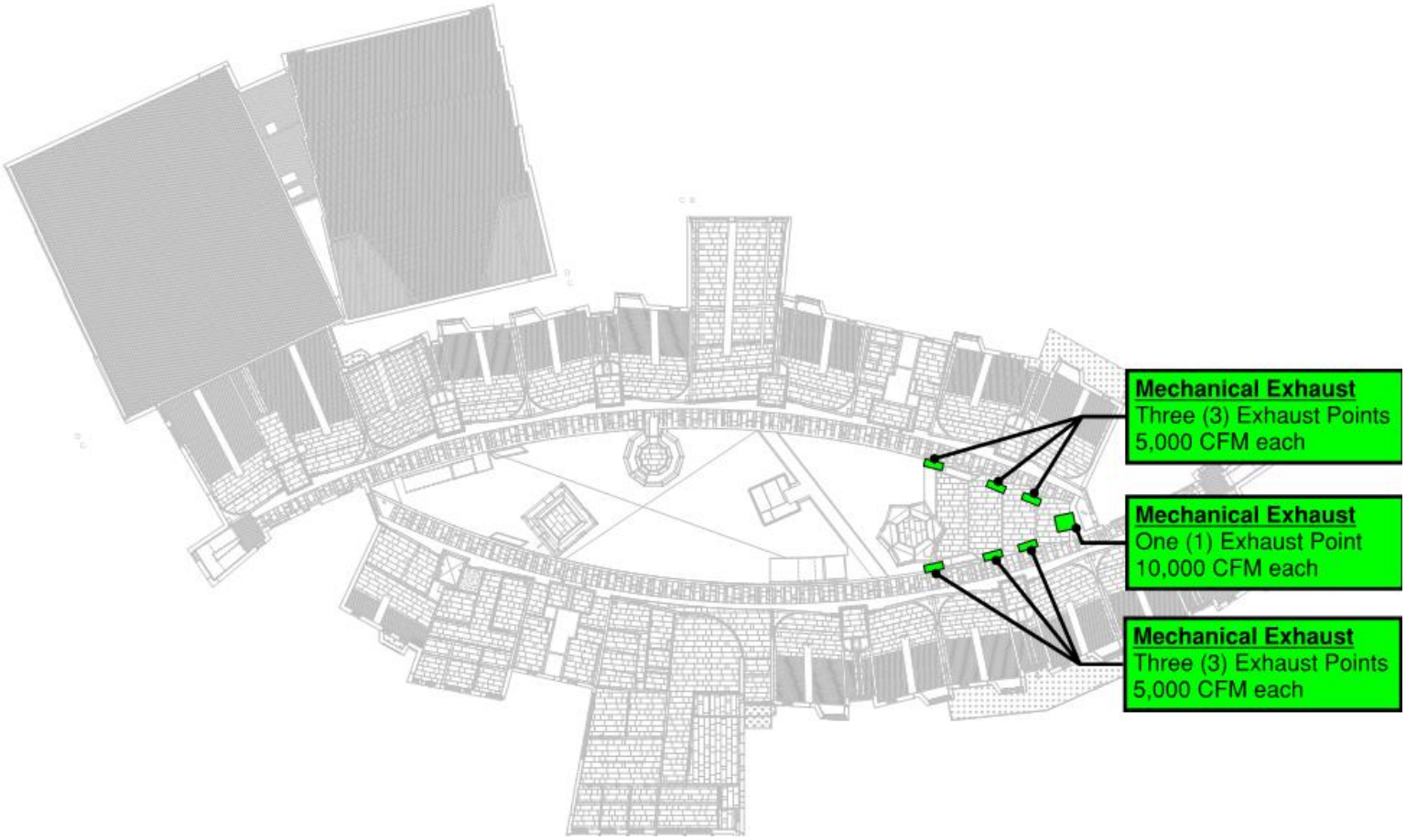


**Figure 2: Smoke Exhaust Configuration (RCP Floor 2)**

## MAKEUP AIR CONFIGURATION

To assist in creating an established two-zone smoke layer environment within the atrium, makeup air must be introduced into the fire compartment at low enough velocity so that the plume filling and entrainment is not significantly increased as a result of turbulent flows. NFPA 92 limits air velocities to 200 feet per minute; however, higher velocities may be considered acceptable where supported by an engineering analysis, such as this Rational Analysis that utilizes CFD modeling (NFPA 92 Section 4.4.4.1.4).

Makeup air for the atrium smoke control system is provided via a combination of automatic doors and louvers (refer to Figure 3 through Figure 5), and summarized below. Selected doors/louvers are to be provided with UL 864 (UUKL) *Listed* power-operator motor controls that will activate upon alarm signal from appropriately zoned sprinkler waterflow switches, manual controls and via smoke detection that is located within the Atrium Zone. Refer to the Equipment and Controls section of this report for additional information.

- **Floor 1 (refer to Figure 3):**
  - Automatic Openings
    - Two (2) louvers providing a minimum of 63 $ft^2$ of free area each
- **Floor 2 (refer to Figure 4):**
  - Automatic Doors / Openings
    - Three (3) exterior single-leaf doors and three (3) interior single-leaf doors providing a minimum of 66 $ft^2$ of free area
    - Two (2) louvers providing a minimum of 63 $ft^2$ of free area each
- **Floor 3 (refer to Figure 5):**
  - Automatic Openings
    - Two (2) louvers providing a minimum of 63 $ft^2$ of free area each

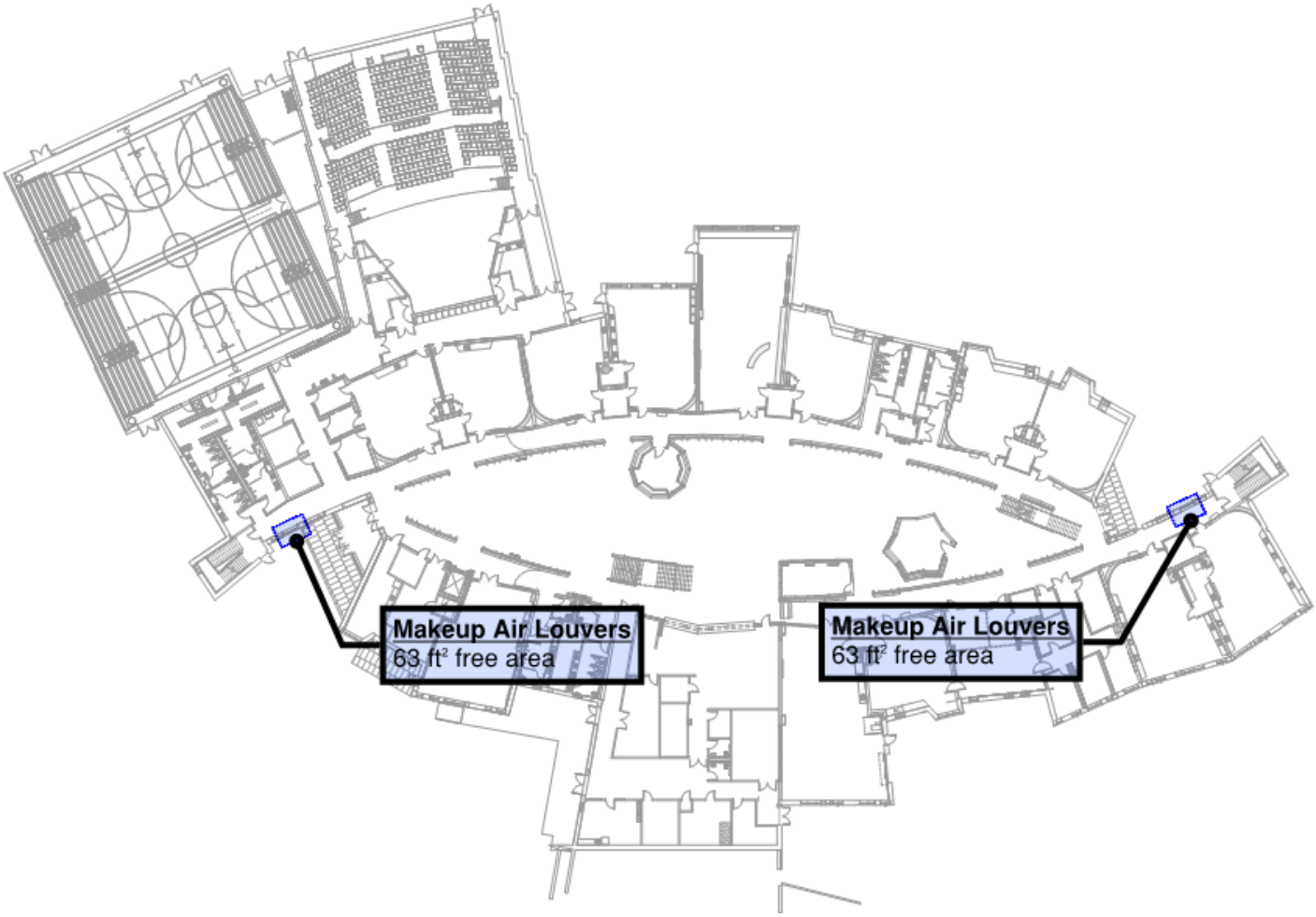


**Figure 3: Makeup Air Configuration – Floor 1 (Plan View)**

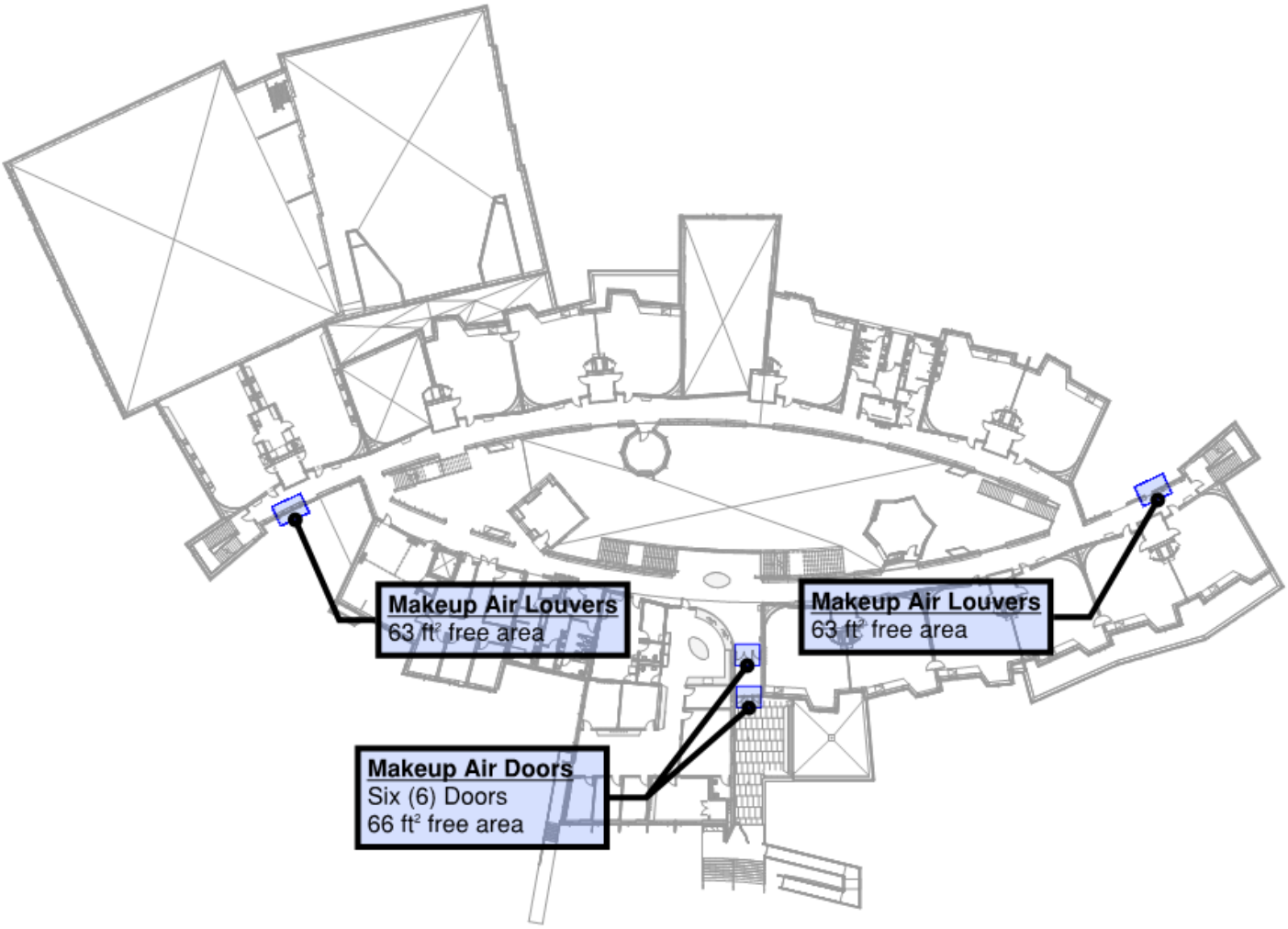


**Figure 4: Makeup Air Configuration – Floor 2 (Plan View)**

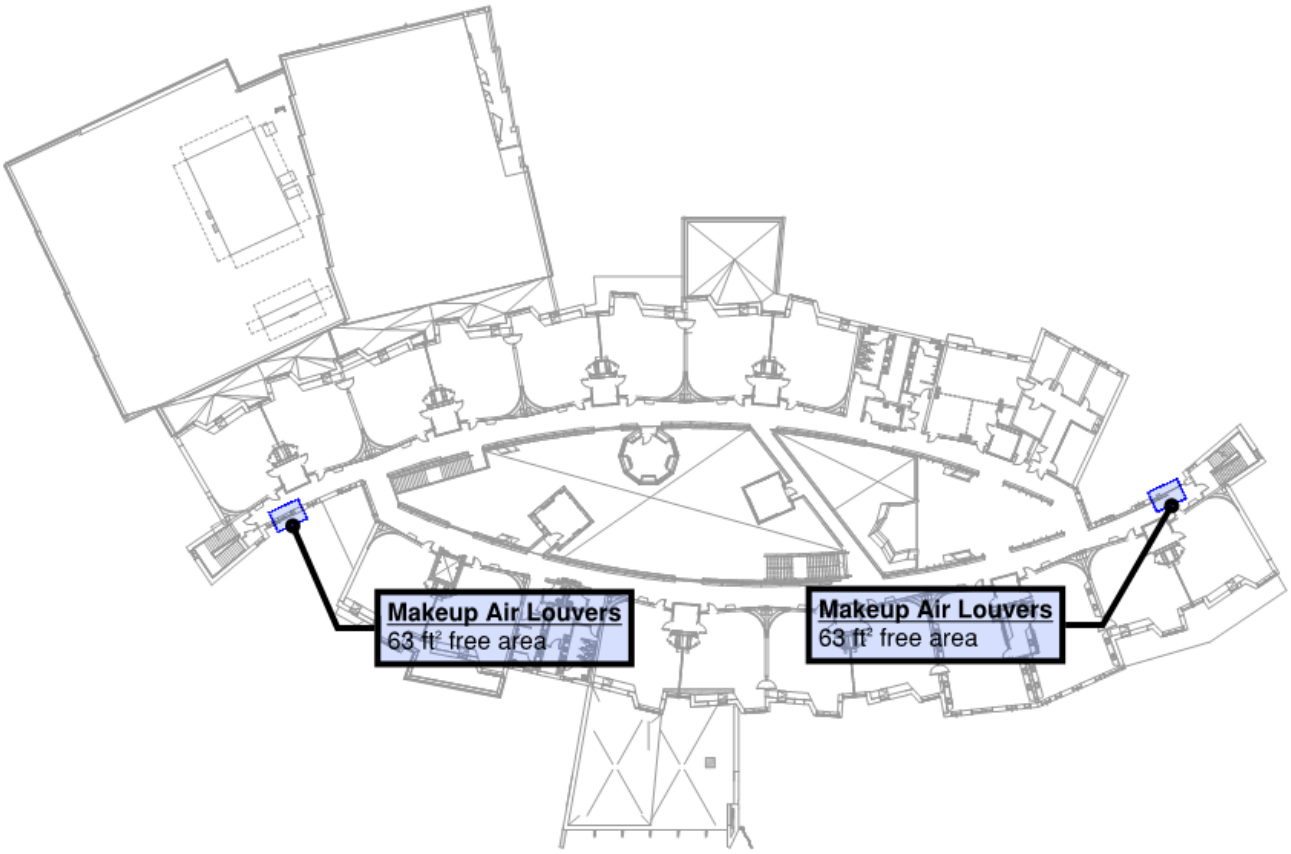


**Figure 5: Makeup Air Configuration – Floor 3 (Plan View)**

Since the makeup air system relies on selected exterior openings to provide air into the Atrium Zone, it is imperative that the owner maintain the required exterior areas free from any impediments that would cause the doors/louvers not to open in an emergency. Specifically, the owner must maintain the surfaces outside all doors and louvers free from obstruction, including snow/ice accumulation anytime that the building is occupied so that the doors/louvers are capable of opening at any time.

***DESIGN FIRE***

The single most important aspect of the Fire Protection Engineering process is the determination of the design fire for the completion of the modeling. Since, this building is an educational/assembly building that contains open spaces suitable for locating seating, tables and chairs, small displays and similar potential fuel loads, the design fire must be representative of this type of hazard.

The intent of the design fire, as one of the primary aspects of any performance-based analysis, is to be a challenging, but realistic scenario to determine factors critical to the outcome of the possible fire. Any given design fire scenario corresponds to only one of many fire conditions that could occur within a building or space. For this reason, a thorough smoke control design consists of analyzing the multiple fire scenarios considered hazardous to the building, its occupants, and its contents[1].

[1] SFPE Engineering Guide to Performance-Based Fire Protection Analysis and Design of Buildings, pgs. 41-42, NFPA, Quincy, MA, 2000

**Design Fire Selection and Details**

For every design fire scenario, numerous factors must be explicitly accounted for as part of the analysis. Examples of factors that may directly influence the parameters of the design fire are listed below:

- Location and form of ignition
- Initial type of fuel ignited
- Initial location of fire
- Rate of growth of the fire (particularly the severity of early stages)
- Smoke generation from the fire
- Compartment geometry and configuration at the time of the fire
- Ventilation – mechanical, natural, HVAC
- Type of construction and materials used
- Room furnishings and contents
- Fire protection and life safety systems

Based on discussions with the Design Team, it is anticipated the atrium in the Framingham Fuller Middle School will be used for the following:

- Small sitting or waiting areas, including sofas, chairs, registration desk, other furniture seating, etc. (primary use of the space).
- Circulation/Waiting space
- Low hazard meeting events (includes tables and chairs only)

As such, from a use and fuel load standpoint, the fire load in the atrium will be a light hazard assembly space. For this reason, nationally recognized, published heat release rates have been researched and fire growth computer models have been completed to determine a realistic worst-case scenario for the purposes of analyzing the atrium smoke control system. Examples of typical fuels loads found in similar spaces can be found in Appendix A.

**Location Analysis**

In order to provide a conservative analysis, the design fire sizes were coupled with points of convergence within the means of egress systems. These points of convergence were chosen based on the following criteria and are discussed further in the following sections of this report:

- Largest Number of Potential Exits Blocked by a Single Realistic Fire
- Largest Reduction in Available Exit Capacity by a Single Realistic Fire
- Remoteness of Secondary Means of Egress
- Building Configuration that Limits Fire Protection and Life Safety System Response

Based on a review of the building, criteria listed above, and the smoke control system exhaust and makeup air configuration, the locations identified in Figure 6 are selected as part of this rational analysis.

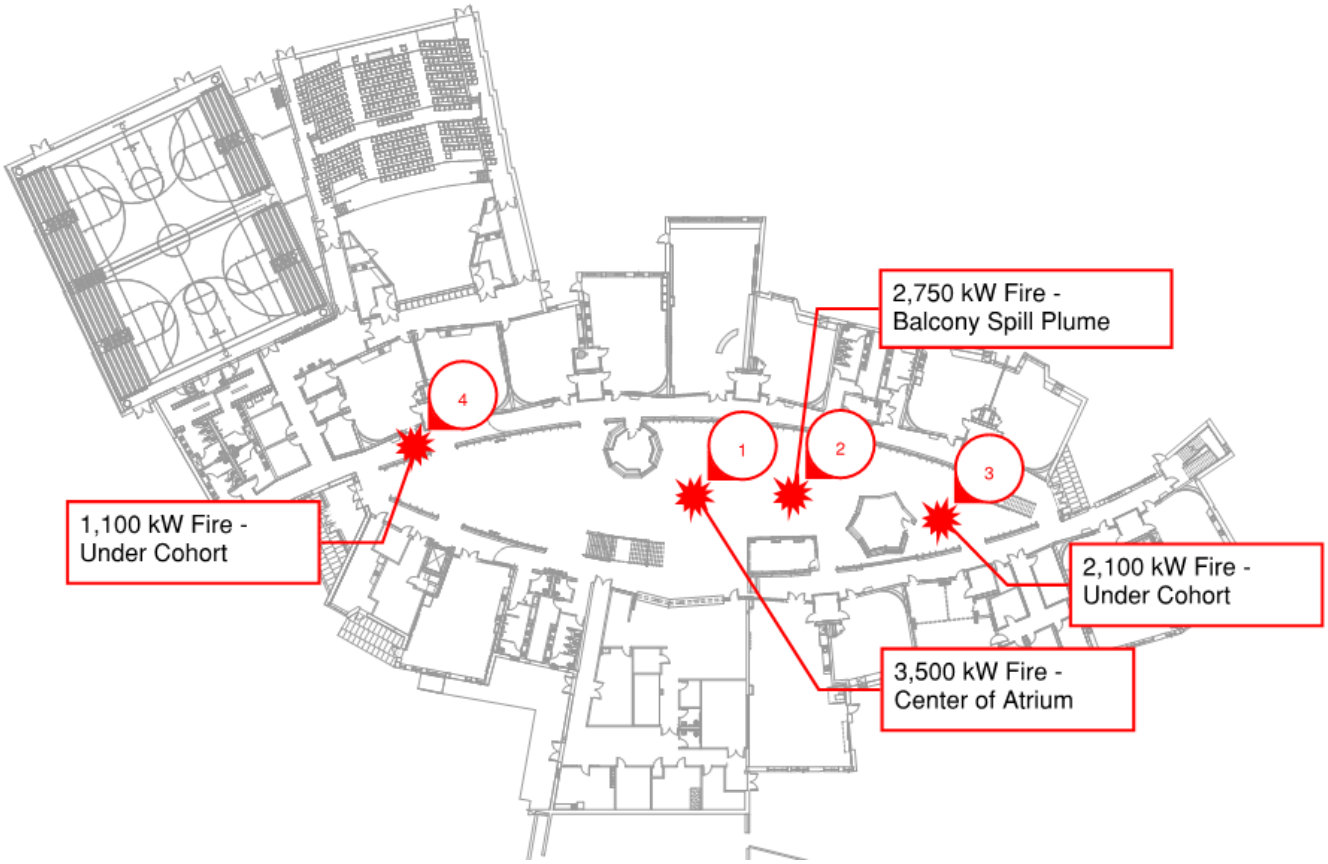


**Figure 6: Floor 1 Fire Locations**

Scenario 1 consists of an axisymmetric design fire located in the center of the atrium on Floor 1. Such a fire would present the largest defined fire as sprinklers are the highest above the walking surface, allowing the fire to grow to a larger size relative to other areas of the building. Larger fires typically result in larger amounts of heat and hot gas; presenting a challenging scenario. This scenario does not contemplate sprinkler activation.

Scenario 2 consists of a sprinkler-controlled balcony-spill plume fire located on Floor 1 underneath the Floor 3 walking surface within the atrium. Such a scenario presents a challenging configuration as the effects of a balcony-spill allows for the heat and hot gas to cool due to the entrainment of cool air, diluting the smoke, causing the upper gas layer to descend. As such, this is considered a challenging location for the design fire.

Scenario 3 consists of a sprinkler-controlled balcony-spill plume fire located on Floor 1 underneath the Floor 3 walking surface nearby the Floor 2 walking surface. Such a scenario presents a challenging configuration as the effects of a balcony-spill allows for the heat and hot gas to cool due to the entrainment of cool air, diluting the smoke, causing the upper gas layer to descend. As such, this is considered a challenging location for the design fire.

Scenario 4 consists of a sprinkler-controlled balcony-spill plume fire located on Floor 1, underneath the Floor 2 walking surface within the atrium and adjacent to the automatic opening louvers. Such a scenario presents a challenging configuration as the effects of a balcony-spill allows for the heat and hot gas to cool due to the entrainment of cool air, diluting the smoke and potentially causing the upper gas layer to descend. Further, by locating the fire adjacent to the automatic opening louvers, the makeup air may disrupt the fire plume further increasing the amount of air entrained in the smoke layer. The intent of this scenario is to determine if a fire on Floor 1 nearby the makeup air openings will affect the surrounding areas of the atrium as intended by the rational analysis requirements in MSBC and NFPA 92.

In a continuing effort to provide a realistic, yet conservative analysis, four (4) specific case scenarios throughout the building are analyzed to evaluate the performance of the building smoke control system. These scenarios, which are based upon the location analysis above, consist of design fires with conservative, yet realistic potential fuel loads as determined in the following sections.

**Scenario 1 – Axisymmetric Design Fire Selection**

It is understood that the atrium will be used primarily for circulation space and is a relatively light hazard space. From a fuel load standpoint, the atrium space may be used for housing small displays, and seating arrangements (tables and chairs, or sofas, etc.). The limitations of this fire size have been discussed with Framingham Fuller Middle School, and this fire size is based on the furniture being located within the atrium.

A sofa fire can reach peak heat release rates of approximately 3,100 kW within 500 seconds before it begins to decay due to fuel consumption. Similarly, a kiosk fires reach a peak heat release rate of 1,800 kW before the fire decays. Using the peak heat release rate of the sofa as our steady state fire value would provide for a conservative analysis. To provide for an extra margin of safety, a fast-growth, steady state fire with an addition safety factor of approximately 10% will be added to the fire size. This allows for ceiling temperatures to rise faster than anticipated due to the fast-growth nature and accumulate as the fire will note decay. **For this reason, the contemplation of a fast growth 3,500 kW steady state fire is considered conservative.** Refer to Figure 7 for a comparison of nationally publicized heat release rate growth profiles compared to the selected fire size used to analyze the smoke control system.

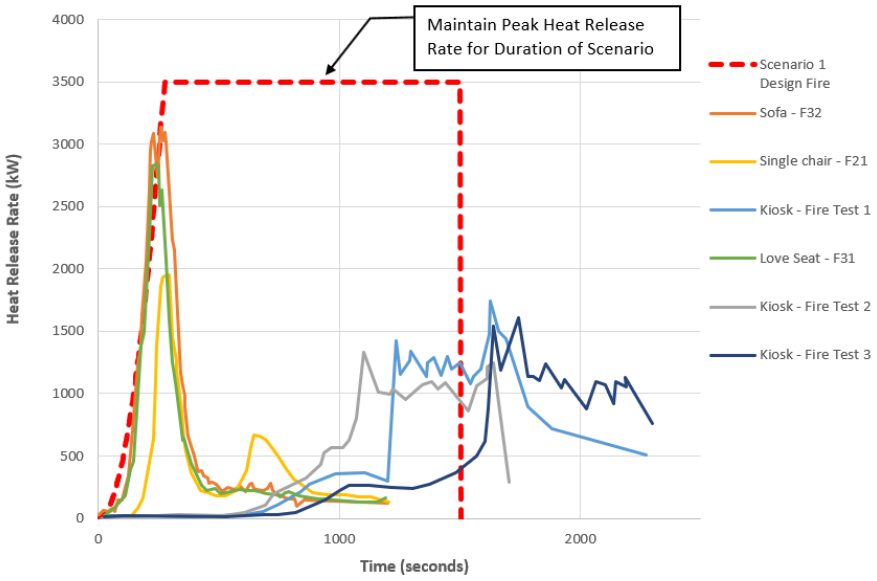


**Figure 7: Kiosk Heat Release Rates with Variations**

**Scenario 2 – Balcony-Spill (Beneath Floor 3 Walking Surface) Design Fire Selection**

When sprinklers are provided in the location where the design fire is located, NFPA 92 Section 5.2.1 indicates that the heat release rate and growth of the fire is likely to be decreased or maintained at the value that the fire has reached when sprinklers activate. MSBC Section 909.9.4 also recognizes this provision. An automatic fire sprinkler system is installed throughout the Framingham Fuller Middle School.

Sprinkler activation calculations have been completed to determine the actual heat release rates where sprinklers activate. The results of this analysis are based on the calculations developed by R.L. Alpert[2] for ceiling jet activation of a sprinkler as shown in Equation 1 and Figure 8.

**Equation 1**

$$T_{cj} - T_\infty = \frac{16.9 Q_{tot}^{2/3}}{H^{5/3}} \qquad \frac{r}{H} \leq 0.18 \ (turning\ region)$$

$$T_{cj} - T_\infty = \frac{5.38 \left(Q_{tot}/r\right)^{2/3}}{H} \qquad \frac{r}{H} \geq 0.18$$

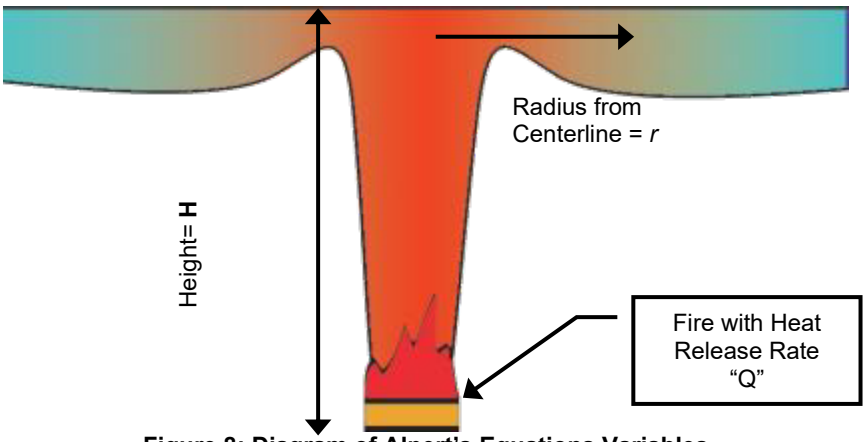


**Figure 8: Diagram of Alpert's Equations Variables**

By utilizing the Alpert's Ceiling Jet Temperature Correlations, it is possible to predict the temperature of the ceiling jet adjacent to the sprinkler and ultimately determine whether sprinkler activation is expected. The results of the calculation utilizing a small time step, and a fast growth rate fire, are shown in Figure 9. The equations utilized to predict the heat release rate from a fast growth rate t-squared fire as noted in Equation 2.

**Equation 2**

$$\dot{Q} = \alpha(t - t_v)^2$$

$$\dot{Q} = \left(\frac{1{,}055}{t_g^2}\right)(t - t_v)^2 [kW]$$

$$\dot{Q} = \left(\frac{1{,}000}{t_g^2}\right)(t - t_v)^2 [Btu/s]$$

Where:
- $t_g$ = fire growth time to 1,000 kW (1,055 BTU/s)
- $t_v$ = virtual ignition time
- α = empirically determined HRR parameter (0.0468 for Fast Growth)

[2] *Ceiling Jet Flows*, p.431, Society of Fire Protection Engineers (SFPE) Handbook, 5th Edition, Springer-Verlag New York 2016

This analysis utilizes the following assumptions:

1. Sprinklers are located a maximum of approximately 26'-0" above the walking surface
2. Sprinkler activation temperature of 165°F
3. Quick response sprinklers having a maximum Response Time Index of 50 (meter-seconds)$^{1/2}$
4. Ambient temperature within the conditions spaces is 68 degrees
5. Sprinkler spacing is a maximum 15' x 15' or 225 ft$^2$ is provided
6. Sprinklers are within 12" of ceiling and are located in the ceiling jet region
7. Burning surface of fuel is approximately 3 feet above the walking surface

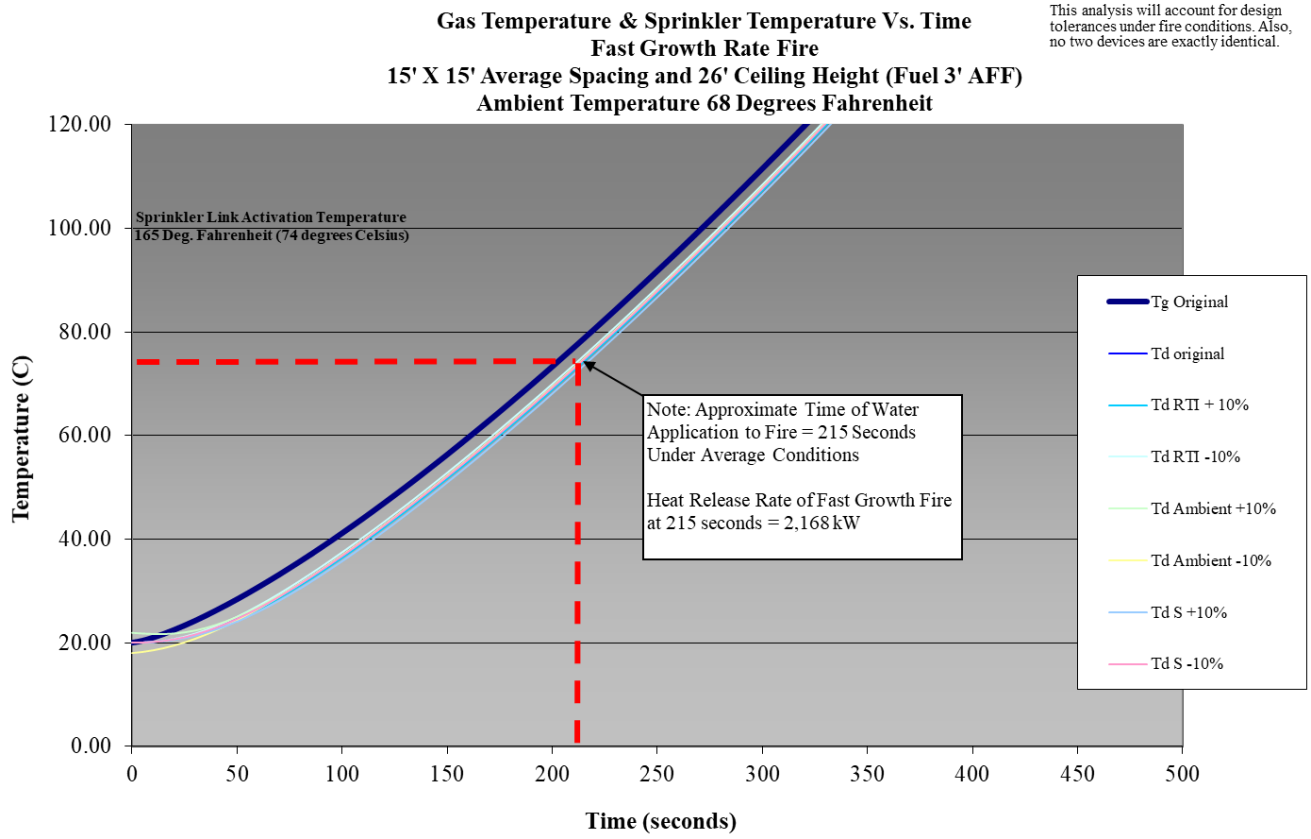


**Figure 9: Scenario 2 Sprinkler Activation Calculation**

The calculations completed in this section indicate that sprinklers are expected to activate at approximately 215 seconds, resulting in an anticipated fire size of 2,168 kW (Figure 9). **Therefore, to be conservative, this analysis contemplates a fast-growth, 2,750 kW steady state fire for duration of 20 minutes. This fire size provides approximately 25% factor of safety, and considering the fire is steady state accounts for the potential spread of fire to additional fuel loads within the atrium.**

**Scenario 3 – Balcony-Spill (Beneath Floor 3 Walking Surface) Design Fire Selection**

When sprinklers are provided in the location where the design fire is located, NFPA 92 Section 5.2.1 indicates that the heat release rate and growth of the fire is likely to be decreased or maintained at the value that the fire has reached when sprinklers activate. MSBC Section 909.9.4 also recognizes this provision. An automatic fire sprinkler system is installed throughout the Framingham Fuller Middle School.

Sprinkler activation calculations have been completed to determine the actual heat release rates where sprinklers activate. The results of this analysis are based on the calculations developed by R.L. Alpert[3] for ceiling jet activation of a sprinkler as shown in Equation 3 and Figure 10.

**Equation 3**

$$T_{cj} - T_\infty = \frac{16.9 Q_{tot}^{2/3}}{H^{5/3}} \qquad \frac{r}{H} \leq 0.18 \; (turning\ region)$$

$$T_{cj} - T_\infty = \frac{5.38 \left(Q_{tot}/r\right)^{2/3}}{H} \qquad \frac{r}{H} \geq 0.18$$

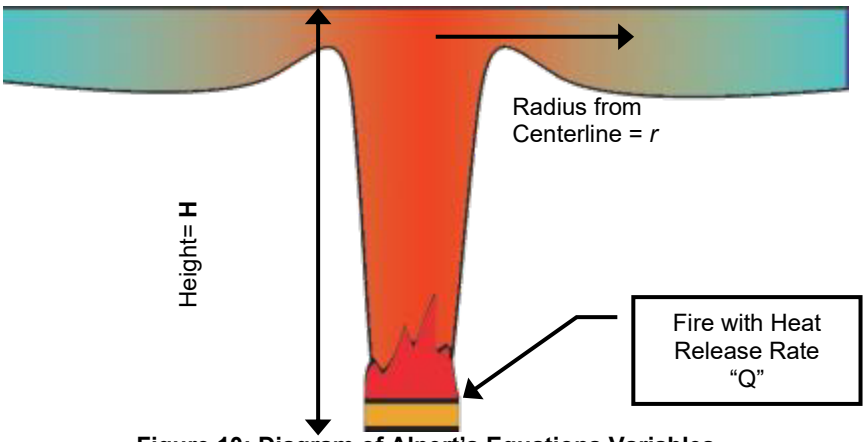


**Figure 10: Diagram of Alpert's Equations Variables**

By utilizing the Alpert's Ceiling Jet Temperature Correlations, it is possible to predict the temperature of the ceiling jet adjacent to the sprinkler and ultimately determine whether sprinkler activation is expected. The results of the calculation utilizing a small time step, and a fast growth rate fire, are shown in Figure 11. The equations utilized to predict the heat release rate from a fast growth rate t-squared fire as noted in Equation 4.

**Equation 4**

$$\dot{Q} = \alpha (t - t_v)^2$$

$$\dot{Q} = \left(\frac{1{,}055}{t_g^2}\right)(t - t_v)^2 [kW]$$

$$\dot{Q} = \left(\frac{1{,}000}{t_g^2}\right)(t - t_v)^2 [Btu/s]$$

Where:

$t_g$ = fire growth time to 1,000 kW (1,055 BTU/s)

$t_v$ = virtual ignition time

α = empirically determined HRR parameter (0.0468 for Fast Growth)

[3] *Ceiling Jet Flows*, p.431, Society of Fire Protection Engineers (SFPE) Handbook, 5th Edition, Springer-Verlag New York 2016

This analysis utilizes the following assumptions:

1. Sprinklers are located a maximum of approximately 26'-3" above the walking surface
2. Sprinkler activation temperature of 165°F
3. Quick response sprinklers having a maximum Response Time Index of 50 (meter-seconds)$^{1/2}$
4. Ambient temperature within the conditions spaces is 68 degrees
5. Sprinkler spacing is a maximum 10' x 13' or 130 ft$^2$ is provided
6. Sprinklers are within 12" of ceiling and are located in the ceiling jet region
7. Burning surface of fuel is approximately 3 feet above the walking surface

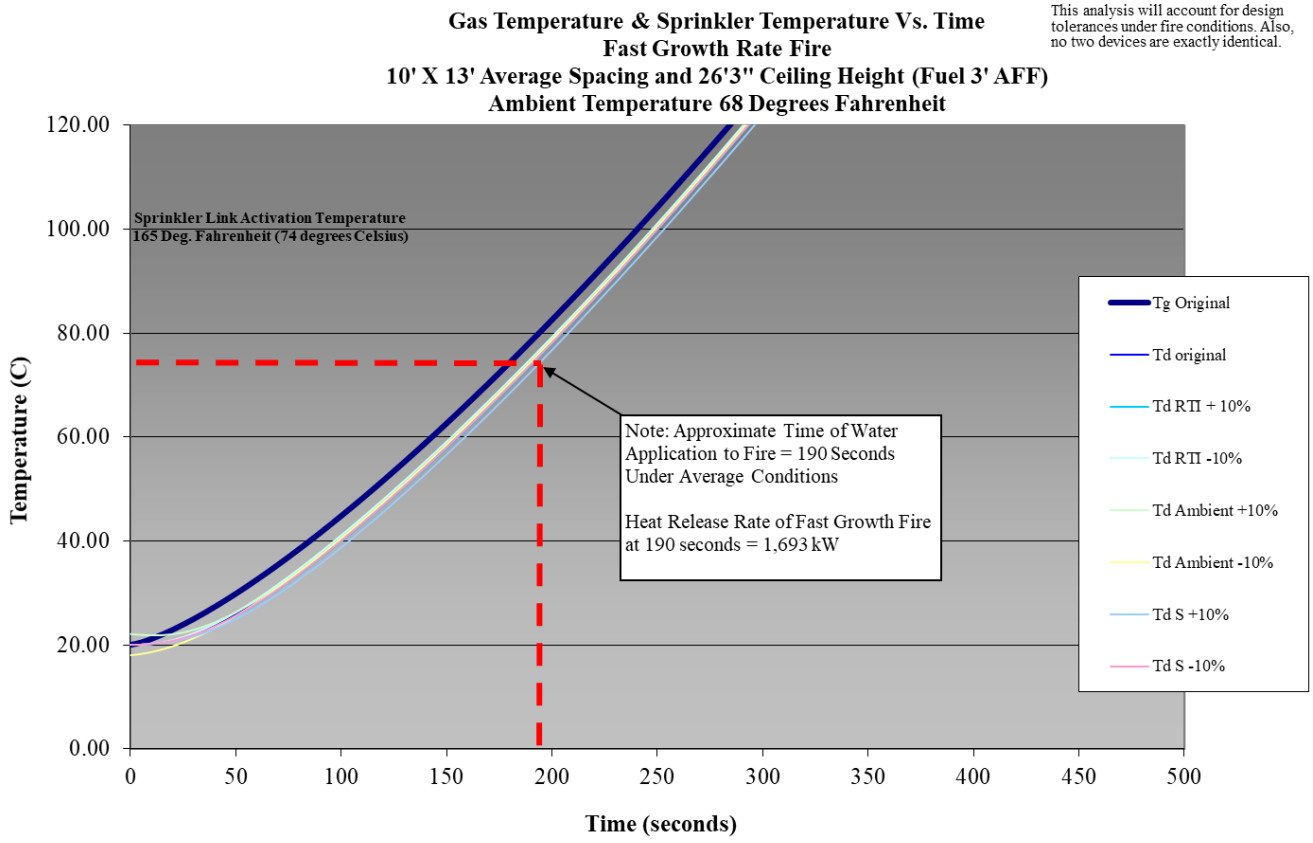


**Figure 11: Scenario 3 Sprinkler Activation Calculation**

The calculations completed in this section indicate that sprinklers are expected to activate at approximately 190 seconds, resulting in an anticipated fire size of 1,693 kW (Figure 11). **Therefore, to be conservative, this analysis contemplates a fast-growth, 2,100 kW steady state fire for duration of 20 minutes. This fire size provides approximately 20% factor of safety, and considering the fire is steady state accounts for the potential spread of fire to additional fuel loads within the atrium.**

**Scenario 4 – Balcony-Spill (Beneath Floor 2 Walking Surface) Design Fire Selection**

When sprinklers are provided in the location where the design fire is located, NFPA 92 Section 5.2.1 indicates that the heat release rate and growth of the fire is likely to be decreased or maintained at the value that the fire has reached when sprinklers activate. MSBC Section 909.9.4 also recognizes this provision. An automatic fire sprinkler system is installed throughout the Framingham Fuller Middle School.

Sprinkler activation calculations have been completed to determine the actual heat release rates where sprinklers activate. The results of this analysis are based on the calculations developed by R.L. Alpert[4] for ceiling jet activation of a sprinkler as shown in Equation 5 and Figure 12.

**Equation 5**

$$T_{cj} - T_\infty = \frac{16.9 Q_{tot}^{2/3}}{H^{5/3}} \qquad \frac{r}{H} \leq 0.18 \; (turning\ region)$$

$$T_{cj} - T_\infty = \frac{5.38 \left(Q_{tot}/r\right)^{2/3}}{H} \qquad \frac{r}{H} \geq 0.18$$

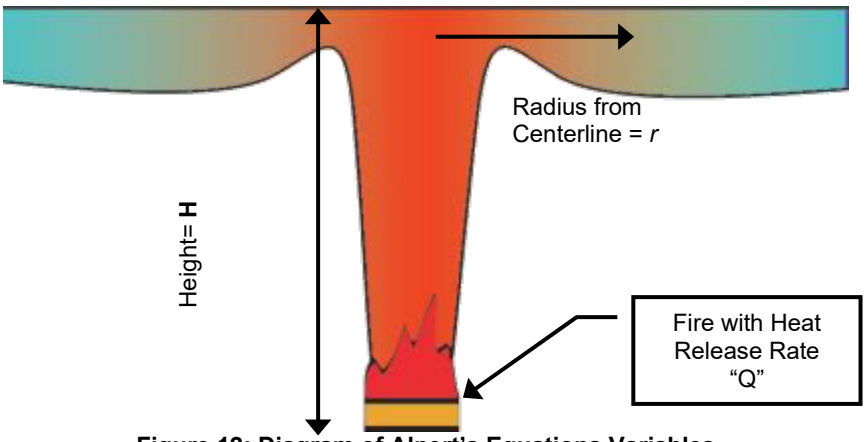


**Figure 12: Diagram of Alpert's Equations Variables**

By utilizing the Alpert's Ceiling Jet Temperature Correlations, it is possible to predict the temperature of the ceiling jet adjacent to the sprinkler and ultimately determine whether sprinkler activation is expected. The results of the calculation utilizing a small time step, and a fast growth rate fire, are shown in Figure 13. The equations utilized to predict the heat release rate from a fast growth rate t-squared fire as noted in Equation 6.

**Equation 6**

$$\dot{Q} = \alpha (t - t_v)^2$$

$$\dot{Q} = \left(\frac{1{,}055}{t_g^2}\right)(t - t_v)^2 [kW]$$

$$\dot{Q} = \left(\frac{1{,}000}{t_g^2}\right)(t - t_v)^2 [Btu/s]$$

Where:

$t_g$ = fire growth time to 1,000 kW (1,055 BTU/s)
$t_v$ = virtual ignition time
α = empirically determined HRR parameter (0.0468 for Fast Growth)

[4] *Ceiling Jet Flows*, p.431, Society of Fire Protection Engineers (SFPE) Handbook, 5th Edition, Springer-Verlag New York 2016

This analysis utilizes the following assumptions:

1. Sprinklers are located a maximum of approximately 12'-0" above the walking surface
2. Sprinkler activation temperature of 165°F
3. Quick response sprinklers having a maximum Response Time Index of 50 (meter-seconds)$^{1/2}$
4. Ambient temperature within the conditions spaces is 68 degrees
5. Sprinkler spacing is a maximum 15' x 15' or 225 ft$^2$ is provided
6. Sprinklers are within 12" of ceiling and are located in the ceiling jet region
7. Burning surface of fuel is approximately 3 feet above the walking surface

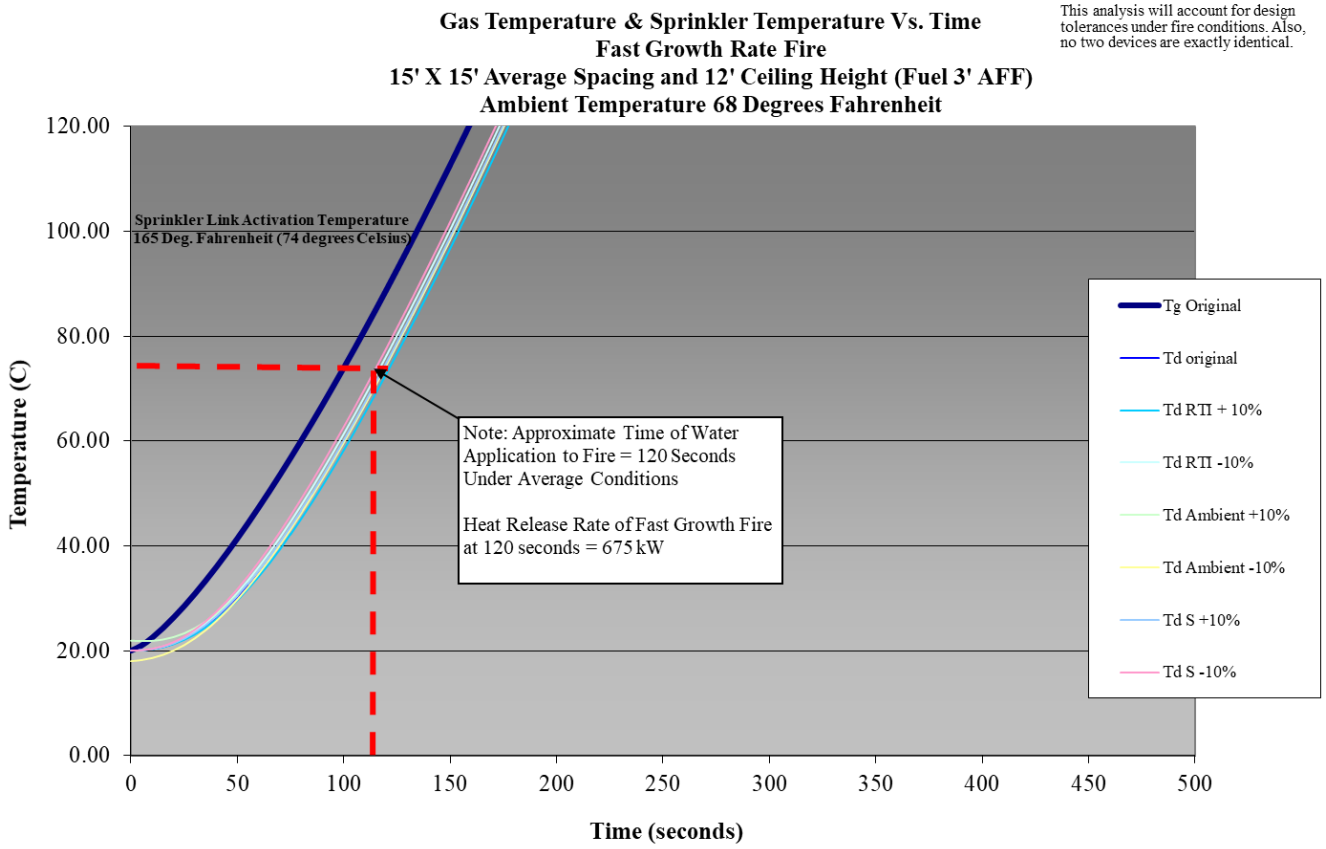


**Figure 13: Scenario 4 Sprinkler Activation Calculation**

The calculations completed in this section indicate that sprinklers are expected to activate at approximately 120 seconds, resulting in an anticipated fire size of 675 kW (Figure 13). **Therefore, to be conservative, this analysis contemplates a fast-growth, 1,100 kW steady state fire for duration of 20 minutes. This fire size provides approximately 50% factor of safety, and considering the fire is steady state accounts for the potential spread of fire to additional fuel loads within the atrium.**

## TENABILITY CRITERIA & THRESHOLDS

There are many products of combustion that are produced by a fire. Not all of these products present an immediate hazard to humans. This report analyzes the tenability environment within the atrium for three major products of combustion during a fire scenario. These products include smoke toxicity, heat exposure (temperature), and visibility. The following sections address the end point criteria, defined as the point where occupants are no longer capable of exiting the building under their own power, for each product analyzed. The failure criteria established in this section is based on the end point thresholds with an additional safety factor to establish reasonable points of failure for the proposed smoke control system design.

### *SMOKE TOXICITY*

Carbon Monoxide (CO), which is an asphyxiant, is one of the major products of combustion that presents a hazard to humans during a fire scenario. Carbon Monoxide inhalation creates a negative feedback loop in the following manner: the presence of increased amounts of carbon monoxide decrease the amount of oxygen consumed; as oxygen consumption decreases occupant respiratory rates increase; as occupant respiratory rates increase, the amount of carbon monoxide inhaled, increases. The intake of too much carbon monoxide leads to disorientation and possibly unconsciousness which negatively affect a person's ability to self-evacuate a building.

Although other gases are produced, carbon monoxide is the most dangerous and one of the leading causes of death from a fire. Therefore, this analysis will focus on the concentration of carbon monoxide produced throughout the atrium for each scenario. It is assumed that other gases are not as hazardous as carbon monoxide, which is consistent with national practice and statistical data. Therefore, if carbon monoxide levels are demonstrated to be acceptable, other less lethal gases will be deemed acceptable.

The toxic effects of carbon monoxide vary based on the concentration, exposure time, and overall activity of the occupants. For example, a person exercising has a higher respiratory rate than a person sitting down. Therefore, a person at higher activity levels will consume more carbon monoxide than a person at rest and will lose consciousness faster. Respiratory levels for three (3) forms of activity can be seen in Table 1.

**Table 1: Respiration minute volume (RMV) (liters/min.) for a 70-kg man (*SFPE Handbook 5th Edition, Chapter 63*)**

| Activity level of subject | $V_E$ (L/min) |
|---|---|
| Resting or sleeping | 8.5 |
| Light work—walking to escape | 25 |
| Heavy work—slow running, walking up stairs | 50 |

The approximate time to loss of consciousness can be calculated based on the CO concentration produced by the design fire using the equation derived from Stewart-Peterson[5]. Stewart-Peterson's equation shown below calculates the amount of carboxyhemoglobin (COHb) produced in the blood stream, which results in a decrease in the blood's oxygen-carrying ability, based on CO concentrations. Documented endpoint criteria for the amount of COHb in one's blood stream before incapacitation has been calculated to be approximately 30-percent[6]. For the purposes of this analysis and to maintain conservatism, it is assumed every occupant is performing light work (i.e., walking around) and each will not be incapacitated for COHb levels less than 25-percent. In addition, for reference purposes, the figure below presents the time to loss of consciousness with respect to carbon monoxide concentration levels, as reproduced below (SFPE Handbook, 5th Edition, Figure 63.14).

**Equation 7 (SFPE Handbook, 5th Edition, Equation 63.18)**

$$\%COH_b = (3.317 \times 10^{-5})(ppmCO)^{1.036}(RMV)(t)$$

Where:

%COHb = Percentage of Carboxyhemoglobin in blood stream
PPM CO = CO concentration (PPM)
RMV = Respiratory minute volume (L/min)
t = exposure time (min)

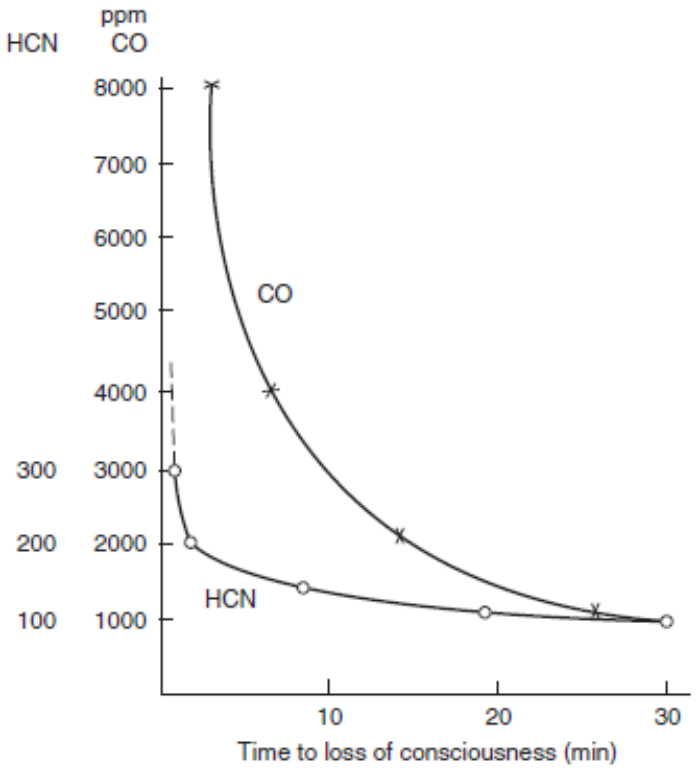


**Figure 14: SFPE Handbook, 5th Edition, Figure 63.14**

[5] *Assessment of Hazards to Occupants from Smoke, Toxic Gas, and Heat, p.2416, Society of Fire Protection Engineers (SFPE) Handbook, 5th Edition, Springer-Verlag New York 2016.*
[6] *Assessment of Hazards to Occupants from Smoke, Toxic Gas, and Heat, p.2332, Society of Fire Protection Engineers (SFPE) Handbook, 5th Edition, Springer-Verlag New York 2016.*

***HEAT EXPOSURE***

Thermal effects of a fire typically present a hazard to occupants in close proximity to a fire or within the hot smoke layer. Due to the footprint of the atrium, it is assumed occupants will be able to maintain a sufficient distance away from any fire avoiding intense amounts of heat. However, hot smoke is buoyant and will rise to create a ceiling layer of hot air/smoke that could potentially affect occupants on higher floor levels where there are low ceiling heights.

Typical results from thermal exposure experienced by humans include hyperthermia, blistering, skin burns, and respiratory tract burns. The temperature thresholds for humans with respect to humidity can be seen in Figure 15.

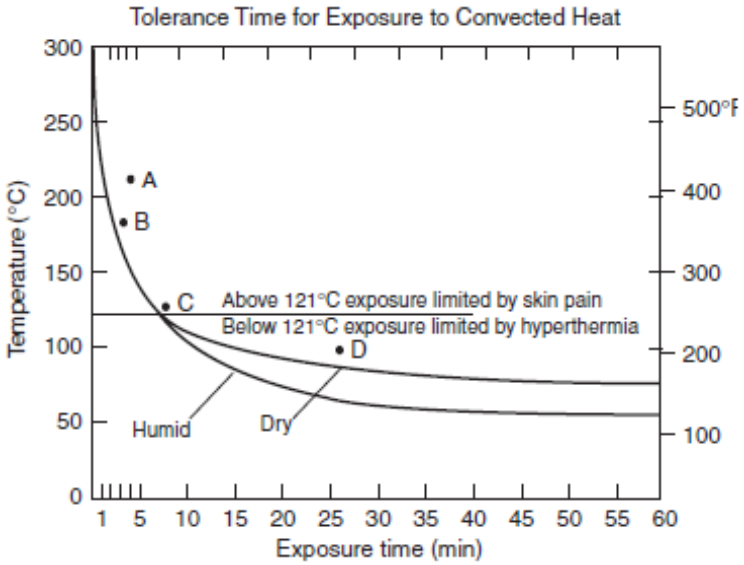


**Figure 15: SFPE Handbook, 5th Edition, Figure 63.28**

As shown in the figure above, humid conditions result in lower temperature thresholds; therefore, to be conservative this analysis will assume the ambient air is humid. Assuming humid conditions, occupants are expected to be capable of exiting the building under temperatures less than 140°F.

***VISIBILITY***

Smoke is typically the biggest threat to building occupants during a fire. Smoke reduces visibility in an egress system which creates longer evacuation times and increased exposure times to the toxic gases and heat of a fire. Different from heat and gases, a reduction in visibility will not cause direct incapacitation of occupants. The concern with a reduction in visibility is that occupants may not be able to find an exit or take excessive amounts of time to reach an exit. This concern increases substantially when occupants are unfamiliar with the building layout. Therefore, a minimum visibility distance must be maintained along the means of egress within the atrium for a minimum of 1.5 times the calculated evacuation time, or 20 minutes after detection, whichever is greater.

Several studies have been conducted that evaluate minimum visibility criteria for both occupants familiar and unfamiliar with the building layout. The research conducted by Rasbash, documented in the Society of Fire Protection Engineering Handbook, 5th Edition, was used as a base point for this analysis. The table excerpted from the SFPE Handbook (Table 2) presents approximate visibility thresholds for people in areas with small enclosures and travel distances versus area with large enclosures and travel distances[7].

**Table 2: Reported Effects of Smoke on Visibility and Behavior (SFPE Handbook, 5th Edition, Table 63.5)**

| Smoke density and irritancy OD/m (extinction coefficient) | | Approximate visibility (diffuse illumination) | Reported effects |
|---|---|---|---|
| None | | Unaffected | Walking speed 1.2 m/s |
| 0.5 (1.15) | Nonirritant | 2 m | Walking speed 0.3 m/s |
| 0.2 (0.5) | Irritant | Reduced | Walking speed 0.3 m/s |
| 0.33 (0.76) | Mixed | 3 m approx. | 30 % people turn back rather than enter |
| Suggested tenability limits for buildings with: | | | |
| Small enclosures and travel distances: | | OD/m 0.2 (visibility 5 m) | |
| Large enclosures and travel distances: | | OD/m 0.08 (visibility 10 m) | |

For the purpose of this analysis, the atrium walking surfaces are considered large enclosures and must maintain a visibility threshold of 10 meters. Narrow corridors that are outside the main atrium and within the atrium bounds must maintain a minimum visibility threshold of 5 meters along the centerline of the corridors. Note that such tenability criteria will be analyzed in areas that are not intimate with the fire.

[7] *Assessment of Hazards to Occupants from Smoke, Toxic Gas, and Heat*, p.2339, Society of Fire Protection Engineers (SFPE) Handbook, 5th Edition, Springer-Verlag New York 2016.

## CFD MODELING ANALYSIS

The following sections outline the information utilized when determining the fire properties, as well as the pass/fail criteria for this assessment.

### *GENERAL CFD MODELING PARAMETERS ASSUMPTIONS*

Along with well-established principles of engineering based on fire tests and historical data, this rational analysis will utilize the three-dimensional computational fluid dynamics computer model Fire Dynamics Simulator (FDS). When performing such analysis with FDS, an accurate combustion model, requires knowledge of the expected commodities that will be present, and must be specified. The design fire contemplates the burning of kiosks/displays, as well as a plastic blend foam cushioned furniture. To model this behavior, the following fuel and environment parameters were selected to represent an anticipated mixed fuel load. General assumptions and critical input parameters for the model were as follows:

1. Mixture Fraction
    - C = 4.56
    - H = 6.56
    - O = 2.34
    - N = 0.4
    - CO_Yield – 0.018
    - Soot_Yield – 0.05
    - Heat of Combustion – 22 kJ/g
2. Emissivity – 0.9
3. Visibility Factor – 8 for Light Emitting Signage

The values listed above are based on large-scale testing, along with well-established principles of engineering based on fire tests and historical data. A 22 kJ/g fuel load, as well as the mixture fraction, and CO and soot yields indicated above, is a conservative measurement for a fuel that is composed of 60-percent cellulosic blend and 40-percent plastic blend mixture. Such factors are an average for the use of the natural cellulose materials and for a plastic material in a 60-percent cellulosic blend and 40-percent plastic blend. The heat of combustion and soot yields are derived from Table 3-4.16 of the SFPE Handbook, 4$^{th}$ Edition.

### *FDS MESH RESOLUTION*

All FDS calculations must be performed within a domain that is made up of rectilinear volumes called “meshes”. Each mesh is subdivided into thousands of uniform rectangular cells, the number of which depends on the desired resolution of the flow dynamics. When determining the appropriate mesh resolution, multiple factors must be considered. For simulations involving buoyant plumes, such as those included within this analysis, a measure of how well the flow field is resolved is given by the non-dimensional expression $D^*/\delta x$, where $D^*$ is a characteristic fire diameter and $\delta x$ is the nominal size of a mesh cell. $D^*$ is calculated utilizing Equation 8 below. The reference (Verification and Validation of Selected Fire Models for Nuclear Plant Applications. NUREG 1824, United States Nuclear Regulatory Commission, 2007) states that FDS could accurately resolve fires when using a $D^*/\delta x$ value between 4 and 16. The values used for each fire scenario are presented in Table 3.

**Equation 8**

$$D^* = \left(\frac{\dot{Q}}{\rho\infty\ cp\ T\infty\ \sqrt{g}}\right)^{2/5}$$

Where:

$\dot{Q}$ = Heat Release Rate (kW)
$\rho\infty$ = density = 1.204kg/m$^3$
$cp$ = specific heat = 1.005 kJ/Kg-K
$T\infty$ = 293 K
$g$ = gravitational acceleration = 9.8 m/s$^2$

**Table 3: Mesh Resolution**

| Scenario | Fire Size | Grid Spacing (δx) | D*/δx Desired Range | D*/δx |
|---|---|---|---|---|
| **1** | 3,500 kW | 0.25 m | 4 – 16<br>Based off reference within the FDS User Guide. | 6.35 |
| **2** | 2,750 kW | 0.25 m | | 5.77 |
| **3** | 2,100 kW | 0.25 m | | 5.18 |
| **4** | 1,100 kW | 0.25 m | | 4.00 |

***CFD RESULTS***

The criteria and design assumptions described in the sections above were inputted into FDS, a computational fluid dynamics model, and each design fire scenarios, as listed in Table 4, were simulated for a duration of 20 minutes after initial detection or 1.5 times the calculated egress time, whichever is greater. Refer to Appendix C for additional information on the Timed Egress Modeling performed as part of this overall analysis.

**Table 4: Fire Scenario Summary**

| Scenario | Location | Fire Size | Design Fire Comments |
|---|---|---|---|
| **1** | Floor 1 – Axisymmetric – Center of Atrium | 3,500 kW | Axisymmetric design fire.<br>Fire located in a sprinklered area.<br>Sprinkler activation is not contemplated.<br>Fast-growth fire profile (α = 0.0469 kW/s$^2$). |
| **2** | Floor 1 – Balcony-Spill Plume (Beneath Floor 3 Walking Surface) | 2,750 kW | Balcony-spill design fire.<br>Fire located in a sprinklered area.<br>Fire is controlled by sprinkler activation.<br>Fast-growth fire profile (α = 0.0469 kW/s$^2$). |
| **3** | Floor 1 – Balcony-Spill Plume (Beneath Floor 3 Walking Surface) | 2,100 kW | Balcony-spill design fire.<br>Fire located in a sprinklered area.<br>Fire is controlled by sprinkler activation.<br>Fast-growth fire profile (α = 0.0469 kW/s$^2$). |
| **4** | Floor 1 – Balcony-Spill Plume (Beneath Floor 2 Walking Surface) | 1,100 kW | Balcony-spill design fire.<br>Fire located in a sprinklered area.<br>Fire is controlled by sprinkler activation.<br>Fast-growth fire profile (α = 0.0469 kW/s$^2$). |

This section presents the results of the FDS computer model, which incorporates the following exhaust and makeup air values in the referenced Scenarios.

- **Exhaust Configuration**
  - 240,000 CFM of mechanically driven exhaust air
    - Exhaust air is provided via multiple points (refer to Figure 1 and Figure 2).

- **Supply Configuration**
  - Floor 1 (refer to Figure 3):
    - Automatic Openings
      - Two (2) louvers providing a minimum of 63 $ft^2$ of free area each
  - Floor 2 (refer to Figure 4):
    - Automatic Doors / Openings
      - Three (3) exterior single-leaf doors and three (3) interior single-leaf doors providing a minimum of 66 $ft^2$ of free area
      - Two (2) louvers providing a minimum of 63 $ft^2$ of free area each
  - Floor 3 (refer to Figure 5):
    - Automatic Openings
      - Two (2) louvers providing a minimum of 63 $ft^2$ of free area each

Although there are a number of aspects of the construction process and tightness of building construction that can affect the velocities, it is anticipated that the average velocities experienced in the field for the building are expected to be within +/- 10% of the predicted values included within the model. It is important to note that some small/localized areas in the areas adjacent to the doors may experience velocities higher than the averages noted herein. These higher velocities may be considered acceptable as long as the average velocities are consistent with the modeling analysis. Specifically, the computer modeling analysis contained herein takes into account effect of the increased velocities at the potential fire locations and their effect on the smoke production rates as required by NFPA 92. As a result, these velocities are allowed in accordance with this engineering analysis, the smoke control system design, and NFPA 92.

Utilizing the above listed smoke control configuration, and as illustrated in Figure 16, the maximum predicted air velocity within the atrium at a location where a potential fuel load may be present is approximately 748 feet per minute and does not impact the smoke control system’s ability to maintain tenable conditions.

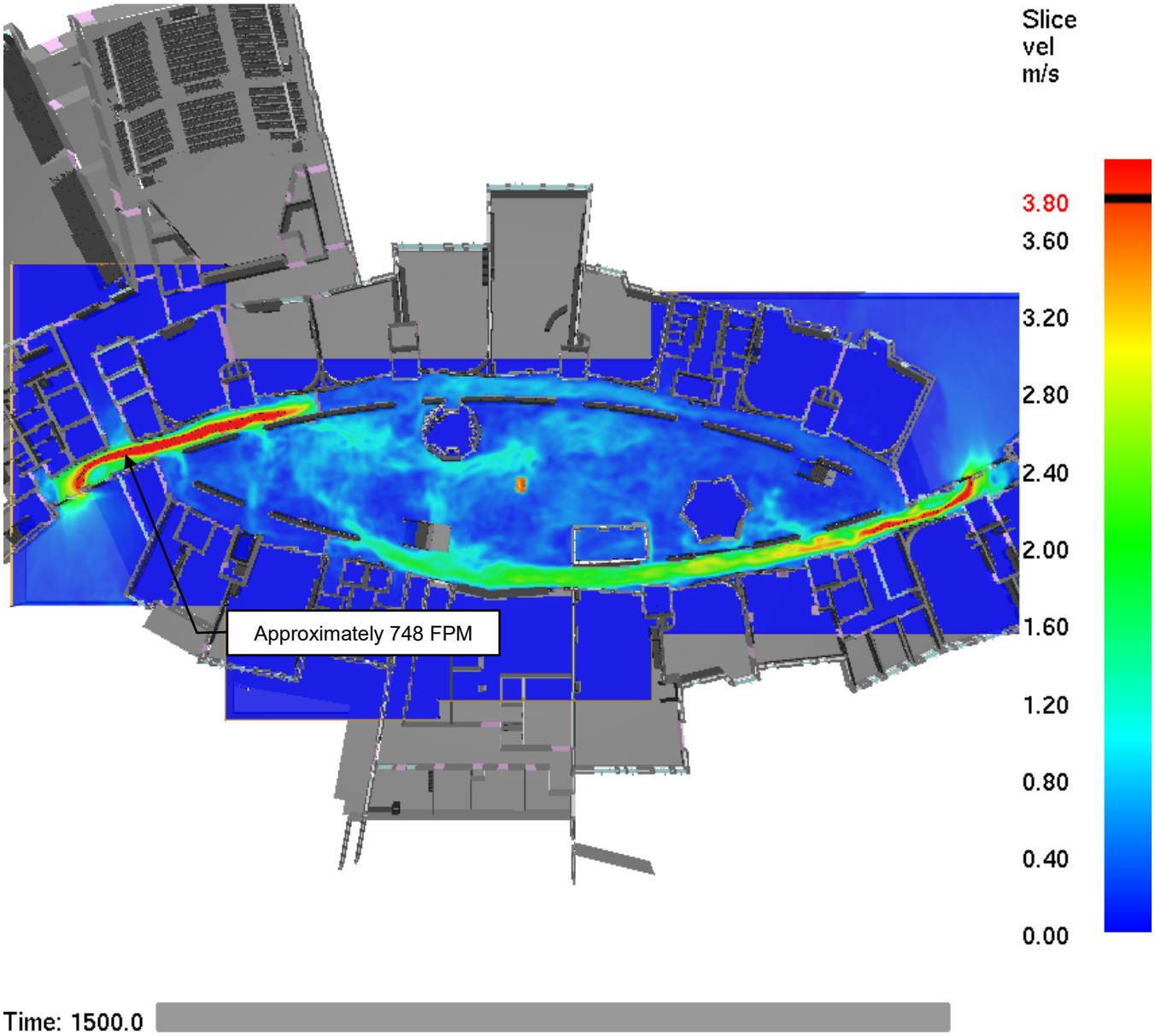


**Figure 16: Predicted Makeup Air Velocity – Floor 1 (Plan View)**

For more detailed information, the Output File generated from FDS can be submitted upon request.

**Scenario 1 – 3,500 kW Axisymmetric Fire Results**

Scenario 1 consists of an axisymmetric 3,500 kW fire located in the center of the atrium on Floor 1. The fire size is based on conservative assumptions and fire test data. The fire is allowed to grow to full size before sprinklers activate and control the fire, allowing it to remain at steady state. Such a scenario presents a very conservative assumption as such fires will decay once the fuel is burned up.

As required by the MSBC, the mechanical exhaust smoke control system must be designed and capable of maintaining tenable conditions 6 feet above the highest walking surface for a minimum of 20 minutes after fire detection or 1.5 times the calculated egress time, whichever is greater. The means of detection in Scenario 1 consists of beam detection located across the ceiling of the atrium. Beam detectors are spaced a maximum of 30-feet apart, and the model assumes an obscuration of 20%, such a setpoint is typical for beam obscuration detection. The use of this detection configuration does not preclude other means of detection such as an air sampling system, or spot-type smoke detection located along underside of the ceiling/roof, as such configurations would provide equivalent levels of detection modeled herein. As a result of such a modeled configuration, detection is noted to occur within 42 seconds. Therefore, tenability criteria for Scenario 1 is analyzed for a minimum of 1,242 seconds of simulation time, as this is greater than 1.5 times the calculated egress time (refer to Appendix C for additional information). The following subsections outline the tenability results recorded for the duration of the scenario.

**SCENARIO 1 SMOKE TOXICITY RESULTS**

As discussed in the Design Assumptions section, carbon monoxide concentration levels were analyzed for the duration of the design fire. From the results, it is possible to determine the worst-case carbon monoxide (CO) concentration levels and where they occur within the occupied portions of the building. As the design fire progressed, concentration levels of CO six (6) feet above each occupied level were recorded with a maximum concentration level of less than 52.2 parts per million (PPM). See screen shots of the model below for illustrative results.

Using a maximum CO concentration of 52.2 PPM, the maximum exposure time before a human becomes incapacitated can be calculated. As discussed above, it is assumed a person may become incapacitated at COHb levels greater than 25-percent within the bloodstream. Using the calculations below, a person would need to be exposed to such conditions within the spaces for over 8.33 hours (500 minutes) during the design fire before they would become incapacitated from the effects of CO. This carbon monoxide concentration would provide occupants with more than enough time to evacuate the building and is considered acceptable conditions.

$$\%COH_b = (3.317 \times 10^{-5})(ppmCO)^{1.036}(RMV)(t)$$

$$(t) = \frac{\%COH_b}{(3.317 \times 10^{-5})(ppmCO)^{1.036}(RMV)}$$

$$(t) = \frac{25\%}{(3.317 \times 10^{-5})(52.2)^{1.036}(25)} = 500\ min$$

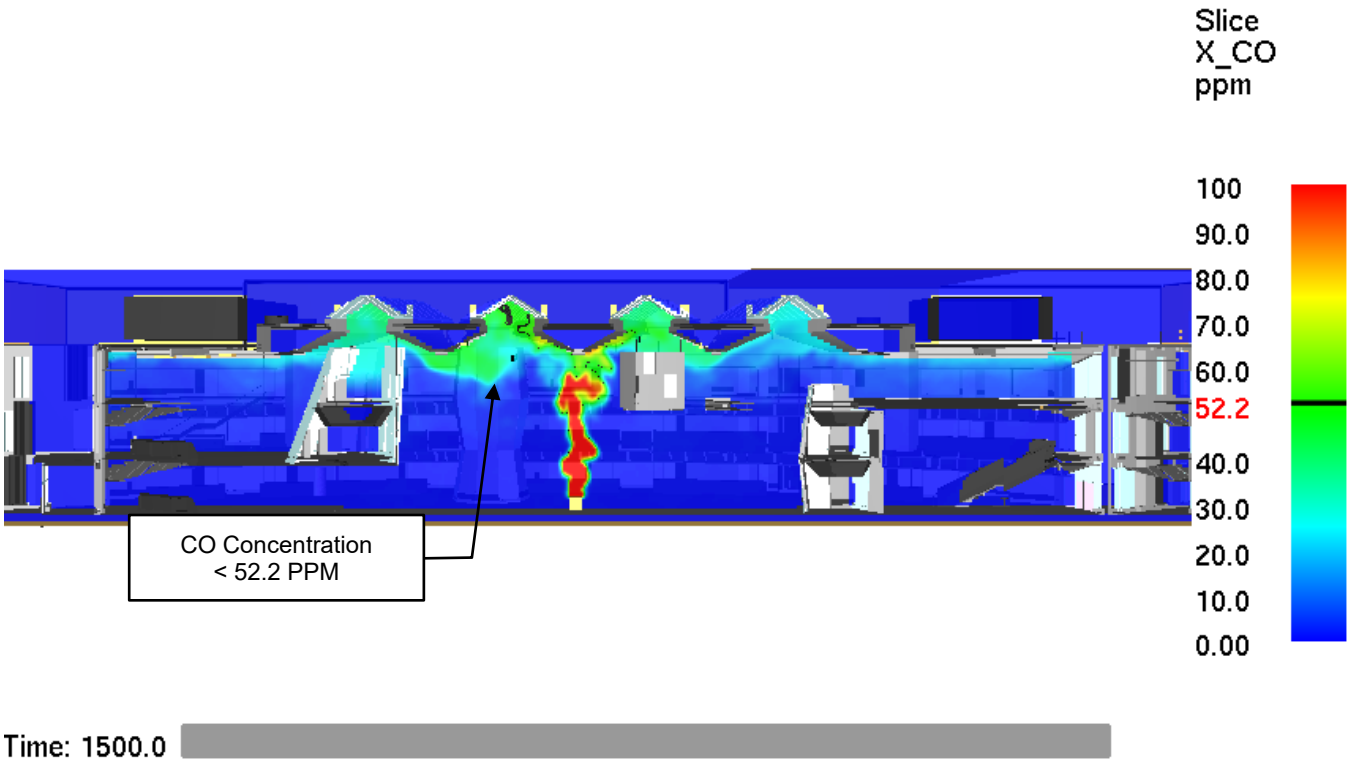


**Figure 17: Scenario 1 – Section View through Fire of CO Concentration**

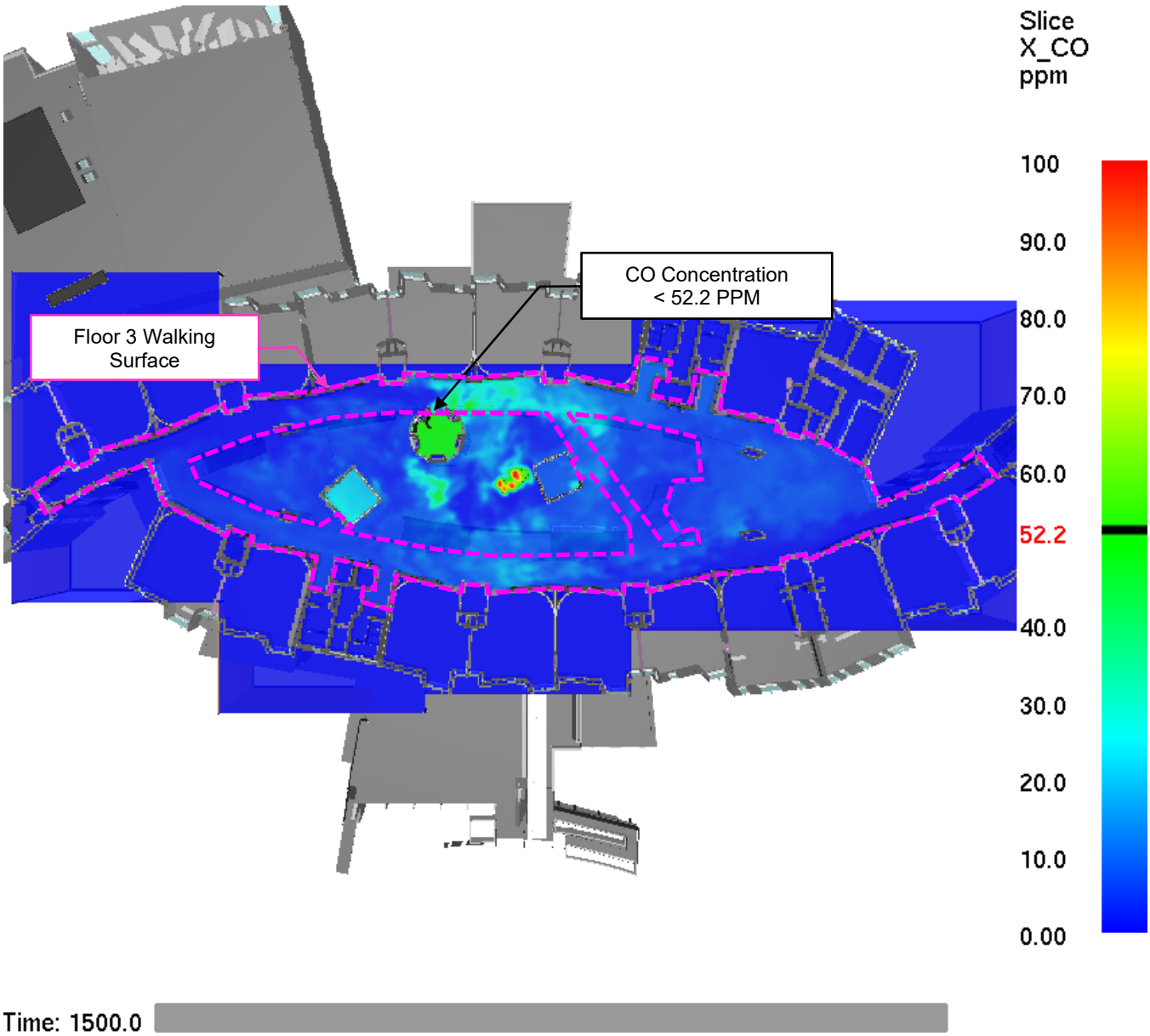


**Figure 18: Scenario 1 – CO concentration 6 ft. above Floor 3 Walking Surface**

## SCENARIO 1 HEAT EXPOSURE RESULTS

The second product of combustion analyzed within the FDS model was temperature. Beginning with an ambient temperature of 68°F, temperature levels were recorded throughout the atrium for the duration of the design fire to determine where the worst-case conditions occur.

As shown in the screen shot captured below, similar to the carbon monoxide concentration, the highest temperature levels occur at the highest levels of the atrium within the smoke filling space. This can be expected because hot air is buoyant and will rise to the ceiling. As the design fire progressed, temperature levels continued to increase 6 feet above the walking surface with a small portion exceeding the maximum temperature level of 140°F. These elevated temperatures were intermittent and brief. Since the average temperature in the atrium is below the 140°F threshold for human tolerance, and the small portion exceeding 140°F was intermittent and brief, the temperature levels are considered acceptable.

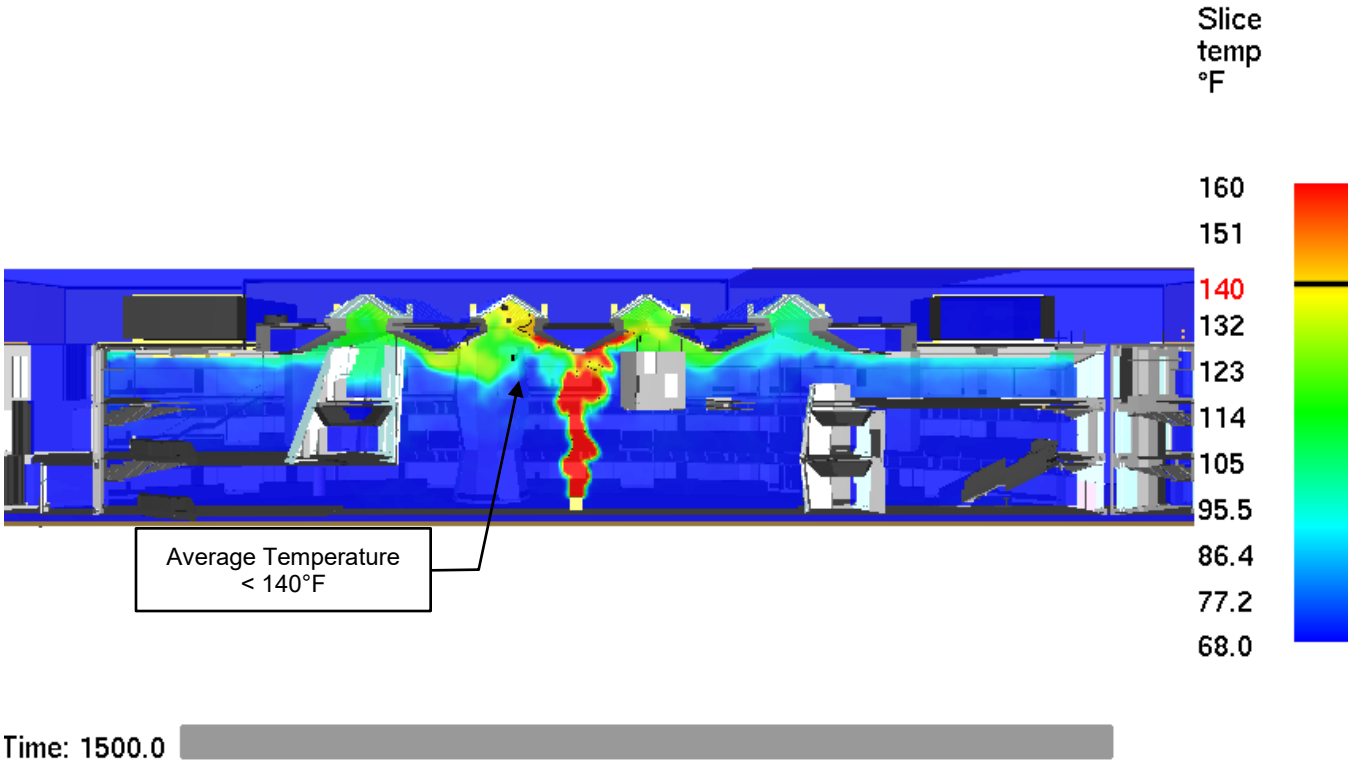


**Figure 19: Scenario 1 – Section View through Fire of Temperature**

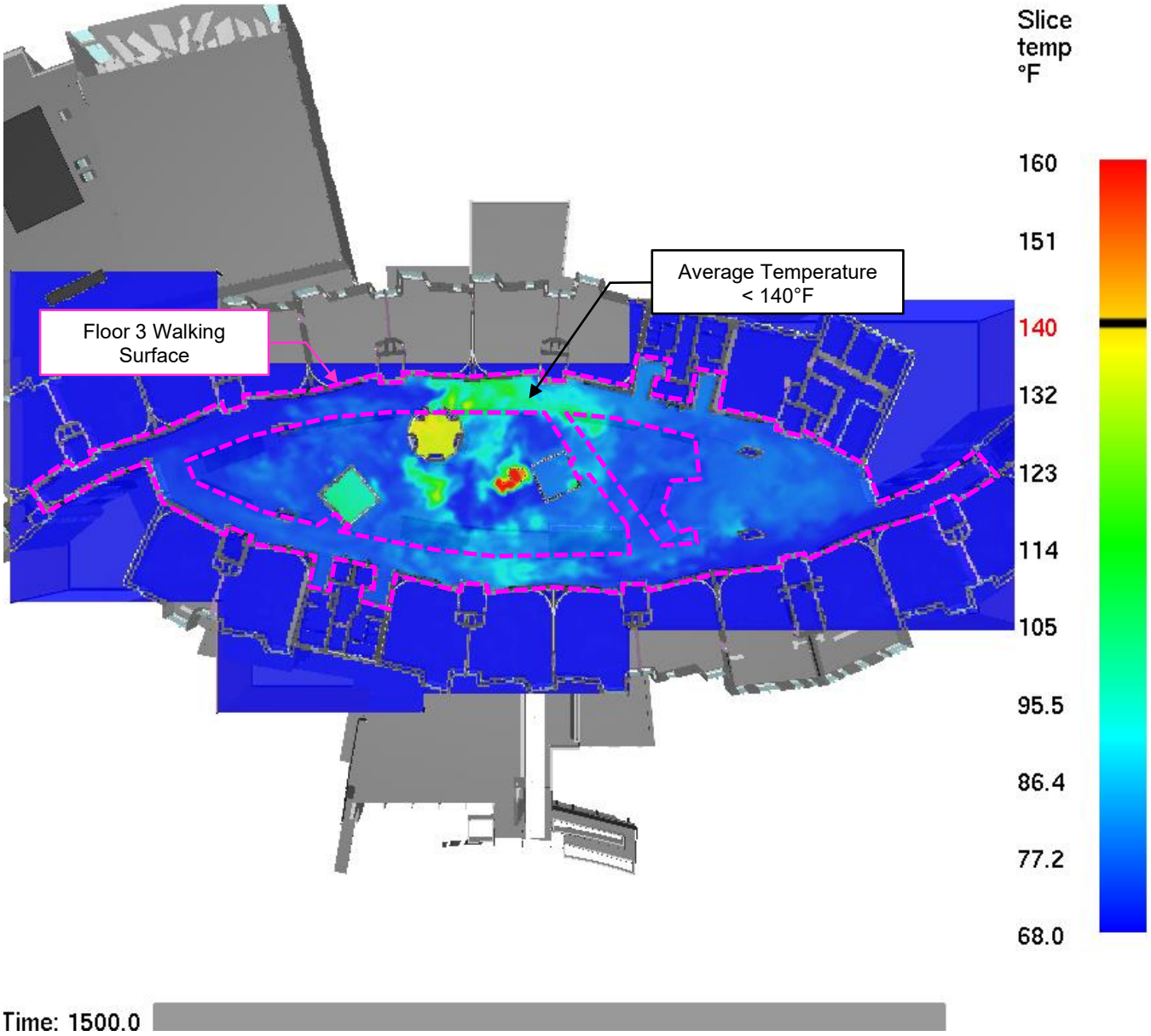


**Figure 20: Scenario 1 – Temperature 6 ft. above Floor 3 Walking Surface**

## SCENARIO 1 VISIBILITY RESULTS

Lastly, visibility conditions were analyzed and recorded within the FDS model throughout the atrium for the duration of the design fire to determine where the worst-case conditions occur. As shown in the screen shots captured below, visibility levels were maintained above the 10-meter tenability threshold in the large atrium spaces over the majority of the means of egress system walking surface. There were small intermittent pockets of reduced visibility, although they were of short duration (less than 60 seconds) and for that reason are acceptable. The visibility levels calculated in the model are sufficient to see all walls and exit signs along the means of egress and is therefore considered acceptable conditions.

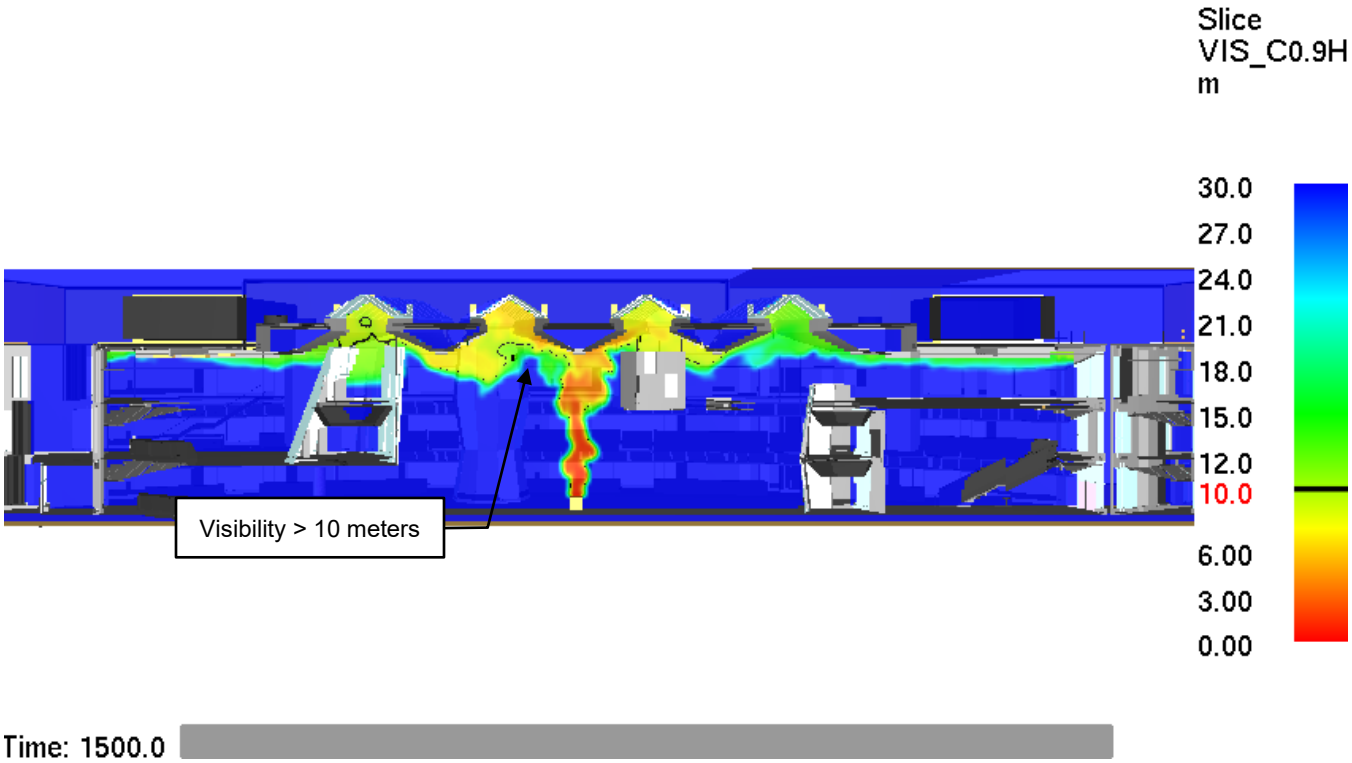


**Figure 21: Scenario 1 – Section View through Fire of Visibility**

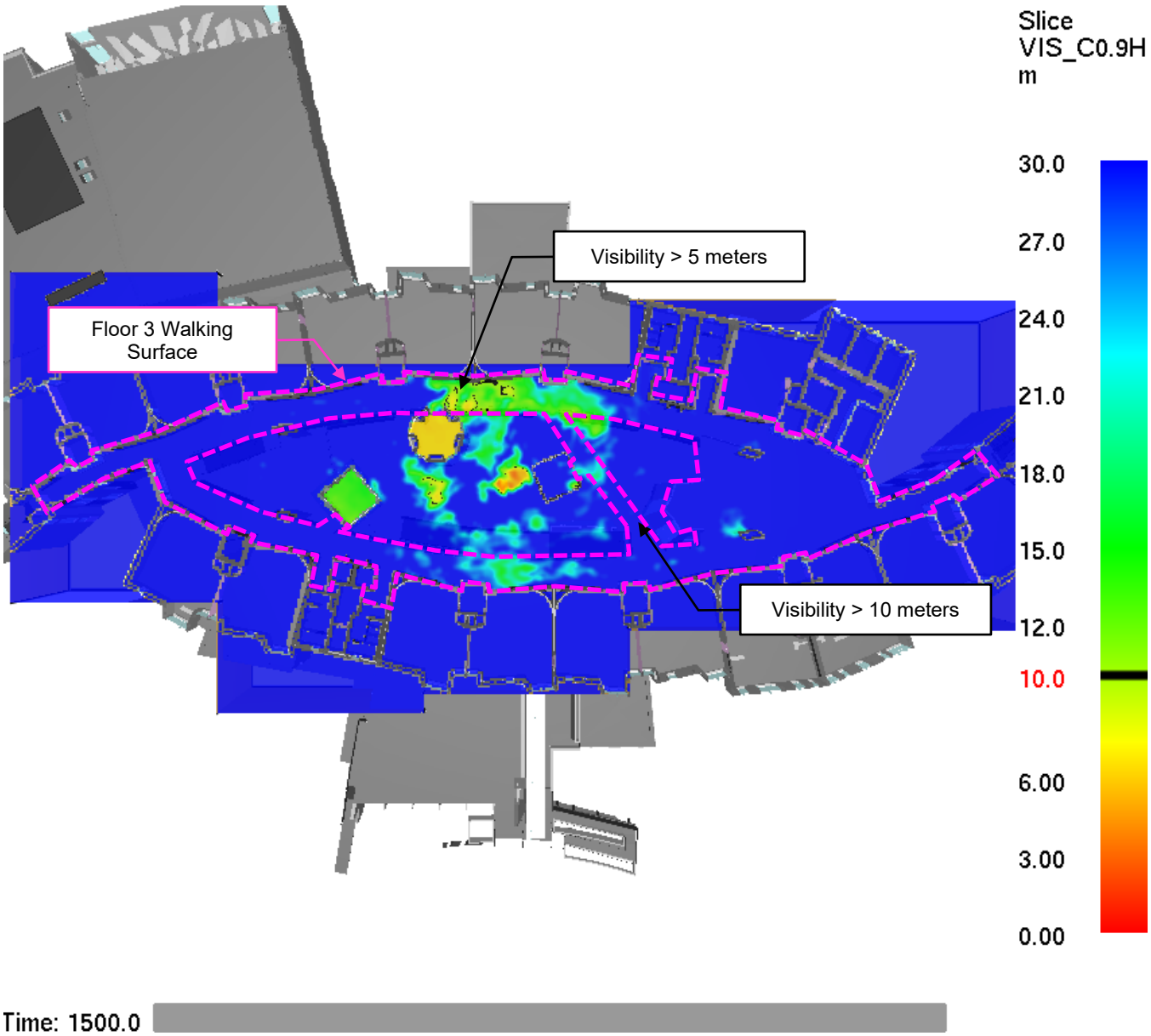


**Figure 22: Scenario 1 – Visibility 6 ft. above Floor 3 Walking Surface**

**Scenario 2 – 2,750 kW Balcony-Spill (Beneath Level 3 Walking Surface) Fire Results**

Scenario 2 consists of a balcony-spill plume 2,750 kW fire located beneath the Level 3 walking surface. The fire size is based on conservative assumptions and fire test data. The fire is allowed to grow to full size before sprinklers activate and control the fire, allowing it to remain at steady state. Such a scenario presents a very conservative assumption as such fires will decay once the fuel is burned up.

As required by the MSBC, the mechanical exhaust smoke control system must be designed and capable of maintaining tenable conditions 6 feet above the highest walking surface for a minimum of 20 minutes after fire detection or 1.5 times the calculated egress time, whichever is greater. The means of detection in Scenario 2 consists of beam detection located across the ceiling of the atrium. Beam detectors are spaced a maximum of 30-feet apart, and the model assumes an obscuration of 20%, such a setpoint is typical for beam obscuration detection. The use of this detection configuration does not preclude other means of detection such as an air sampling system, or spot-type smoke detection located along underside of the ceiling/roof, as such configurations would provide equivalent levels of detection modeled herein. As a result of such a modeled configuration, detection is noted to occur within 51 seconds. Therefore, tenability criteria for Scenario 2 is analyzed for a minimum of 1,251 seconds of simulation time, as this is greater than 1.5 times the calculated egress time (refer to Appendix C for additional information). The following subsections outlines the tenability results recorded for the duration of the scenario.

**SCENARIO 2 SMOKE TOXICITY RESULTS**

As discussed in the Design Assumptions section, carbon monoxide concentration levels were analyzed for the duration of the design fire. From the results, it is possible to determine the worst-case carbon monoxide (CO) concentration levels and where they occur within the occupied portions of the building. As the design fire progressed, concentration levels of CO six (6) feet above each occupied level were recorded with a maximum concentration level of less than 41.6 parts per million (PPM). See screen shots of the model below for illustrative results.

Using a maximum CO concentration of 41.6 PPM, the maximum exposure time before a human becomes incapacitated can be calculated. As discussed above, it is assumed a person may become incapacitated at COHb levels greater than 25-percent within the bloodstream. Using the calculations below, a person would need to be exposed to such conditions within the spaces for over 10.55 hours (633 minutes) during the design fire before they would become incapacitated from the effects of CO. This carbon monoxide concentration would provide occupants with more than enough time to evacuate the building and is considered acceptable conditions.

$$\%COH_b = (3.317 \times 10^{-5})(ppmCO)^{1.036}(RMV)(t)$$

$$(t) = \frac{\%COH_b}{(3.317 \times 10^{-5})(ppmCO)^{1.036}(RMV)}$$

$$(t) = \frac{25\%}{(3.317 \times 10^{-5})(41.6)^{1.036}(25)} = 633\ min$$

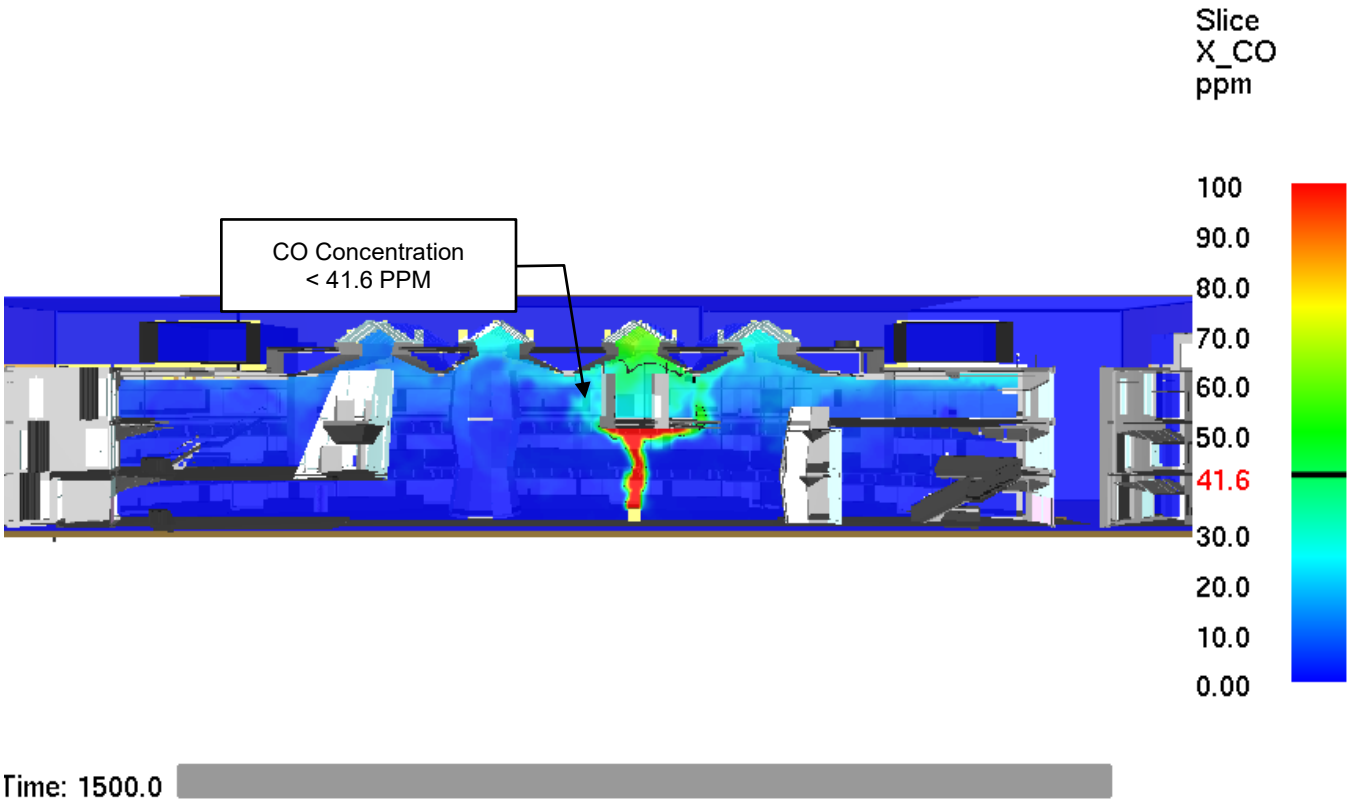


**Figure 23: Scenario 2 – Section View through Fire of CO Concentration**

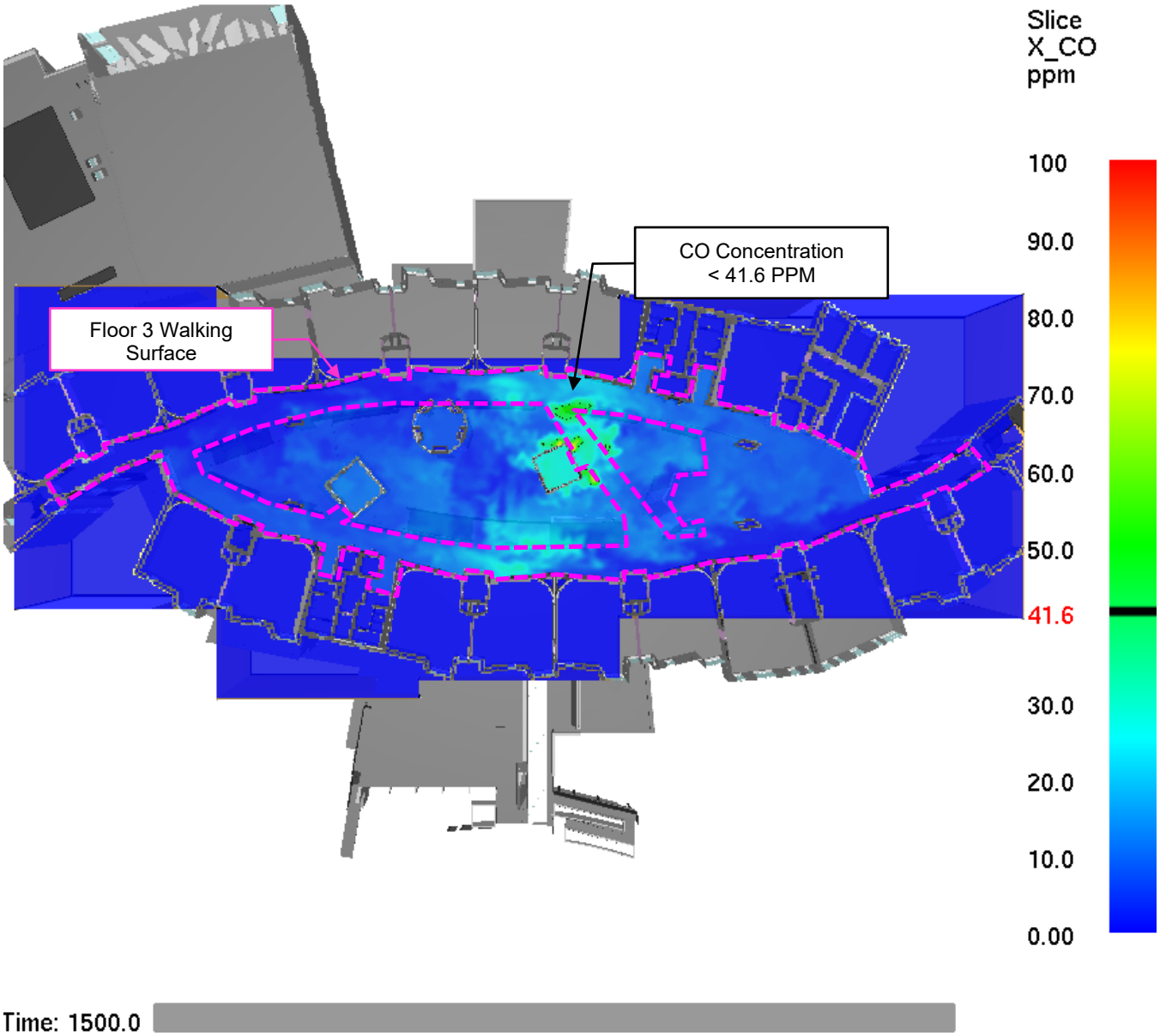


**Figure 24: Scenario 2 – CO concentration 6 ft. above Floor 3 Walking Surface**

## SCENARIO 2 HEAT EXPOSURE RESULTS

The second product of combustion analyzed within the FDS model was temperature. Beginning with an ambient temperature of 68°F, temperature levels were recorded throughout the atrium for the duration of the design fire to determine where the worst-case conditions occur.

As shown in the screen shot captured below, similar to the carbon monoxide concentration, the highest temperature levels occur at the highest levels of the atrium within the smoke filling space. This can be expected because hot air is buoyant and will rise to the ceiling. As the design fire progressed, temperature levels continued to increase 6 feet above the walking surface with a small portion exceeding the maximum temperature level of 140°F. This occurs along the walking surface directly above the fire, in addition these elevated temperatures were intermittent and brief. Since the average temperature in the atrium is below the 140°F threshold for human tolerance, and the small portion exceeding 140°F was intermittent and intimate with the fire plume, the temperature levels are considered acceptable.

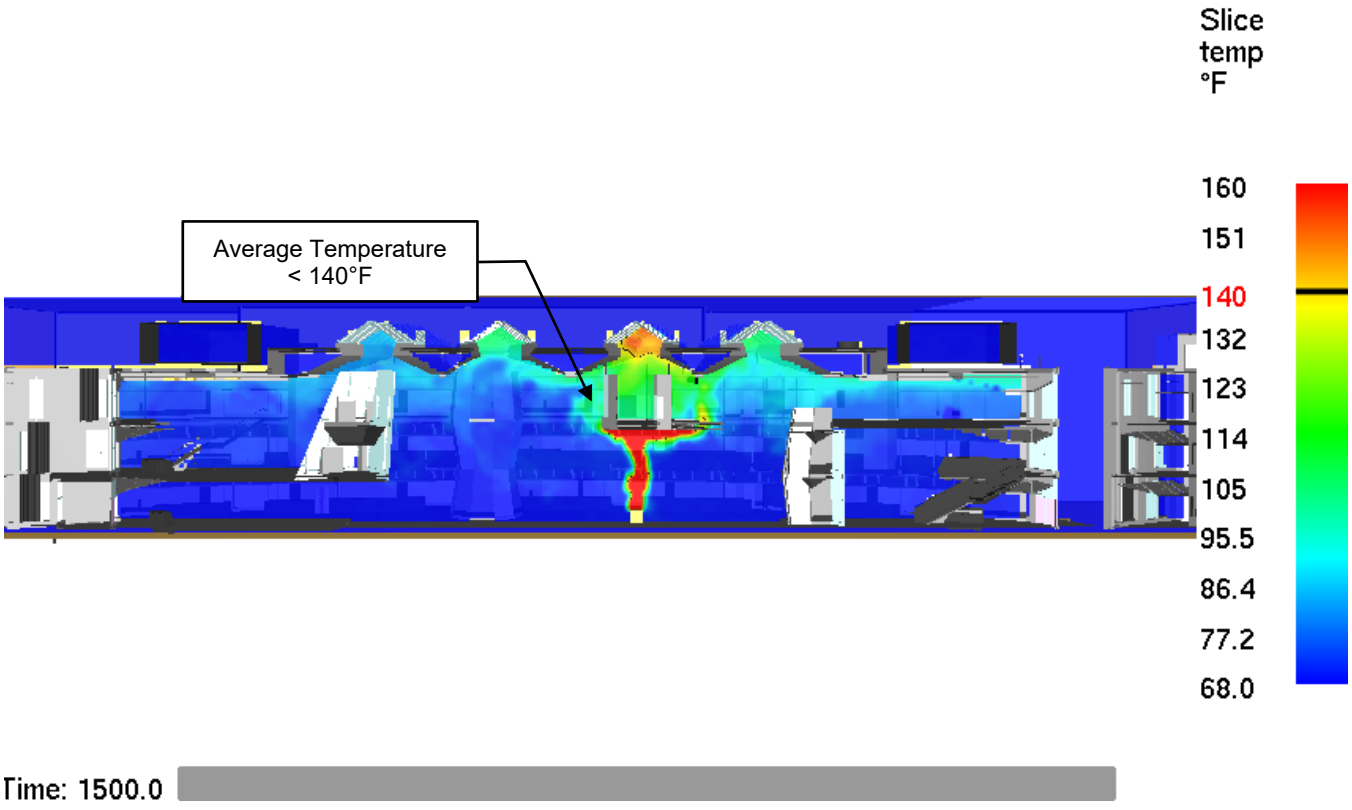


**Figure 25: Scenario 2 – Section View through Fire of Temperature**

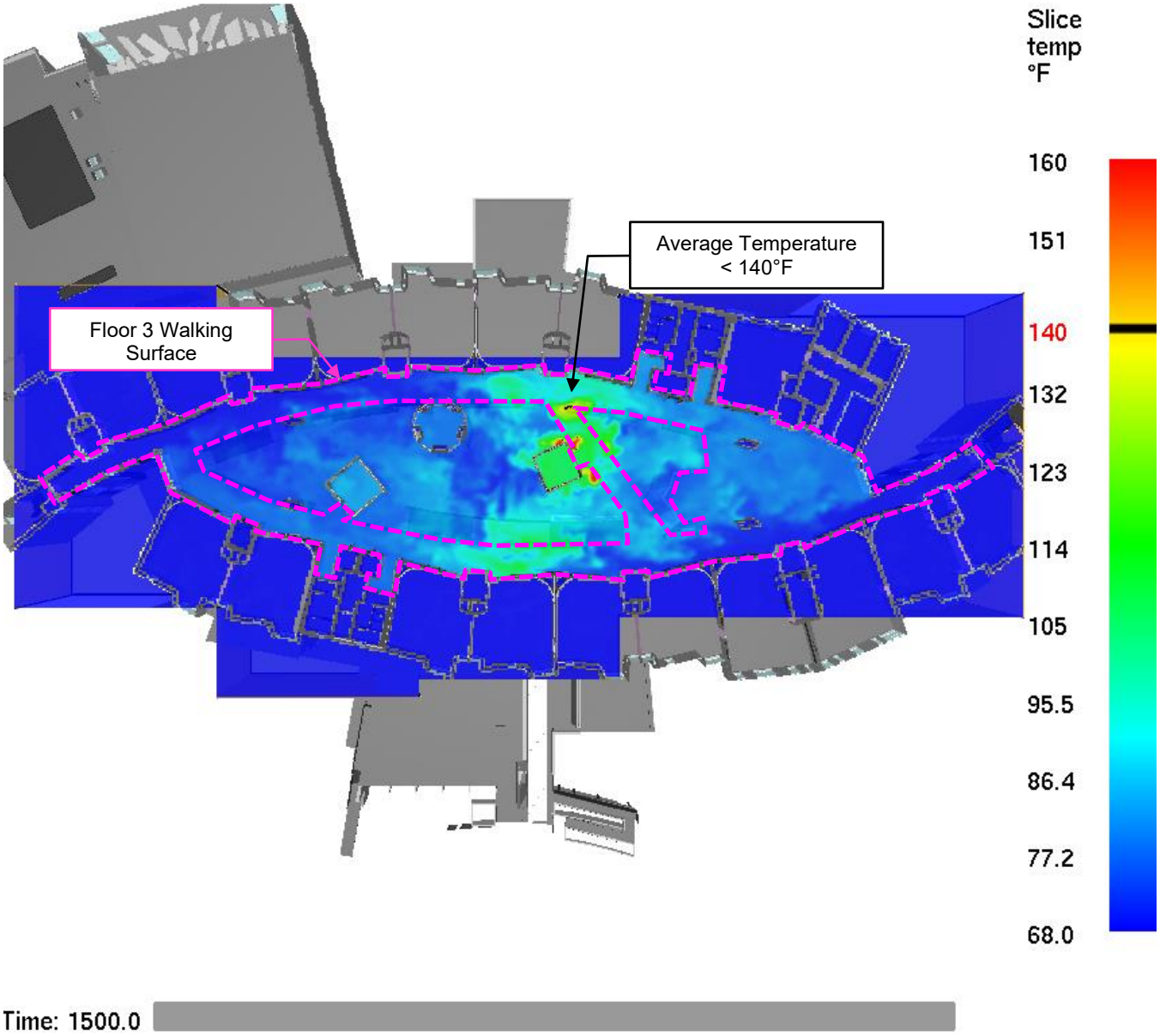


**Figure 26: Scenario 2 – Temperature 6 ft. above Floor 3 Walking Surface**

## SCENARIO 2 VISIBILITY RESULTS

Lastly, visibility conditions were analyzed and recorded within the FDS model throughout the atrium for the duration of the design fire to determine where the worst-case conditions occur. As shown in the screen shots captured below, visibility levels were maintained above the 10-meter tenability threshold in the large atrium spaces over the majority of the means of egress system walking surface. There were small pockets of reduced visibility along the walking surface directly above the fire. This area is intimate with the fire plume and for that reason is acceptable. The visibility levels calculated in the model are sufficient to see all walls and exit signs along the means of egress and is therefore considered acceptable conditions.

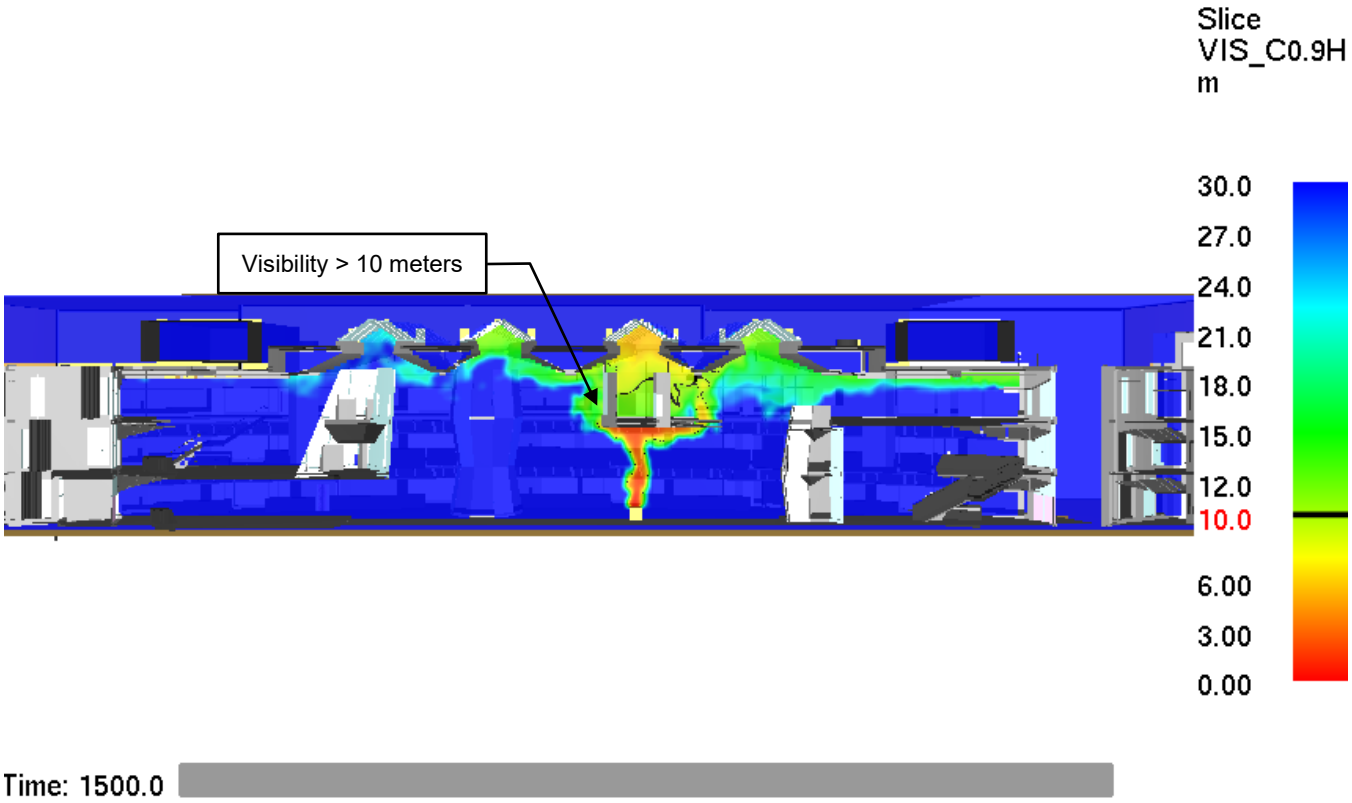


**Figure 27: Scenario 2 – Section View through Fire of Visibility**

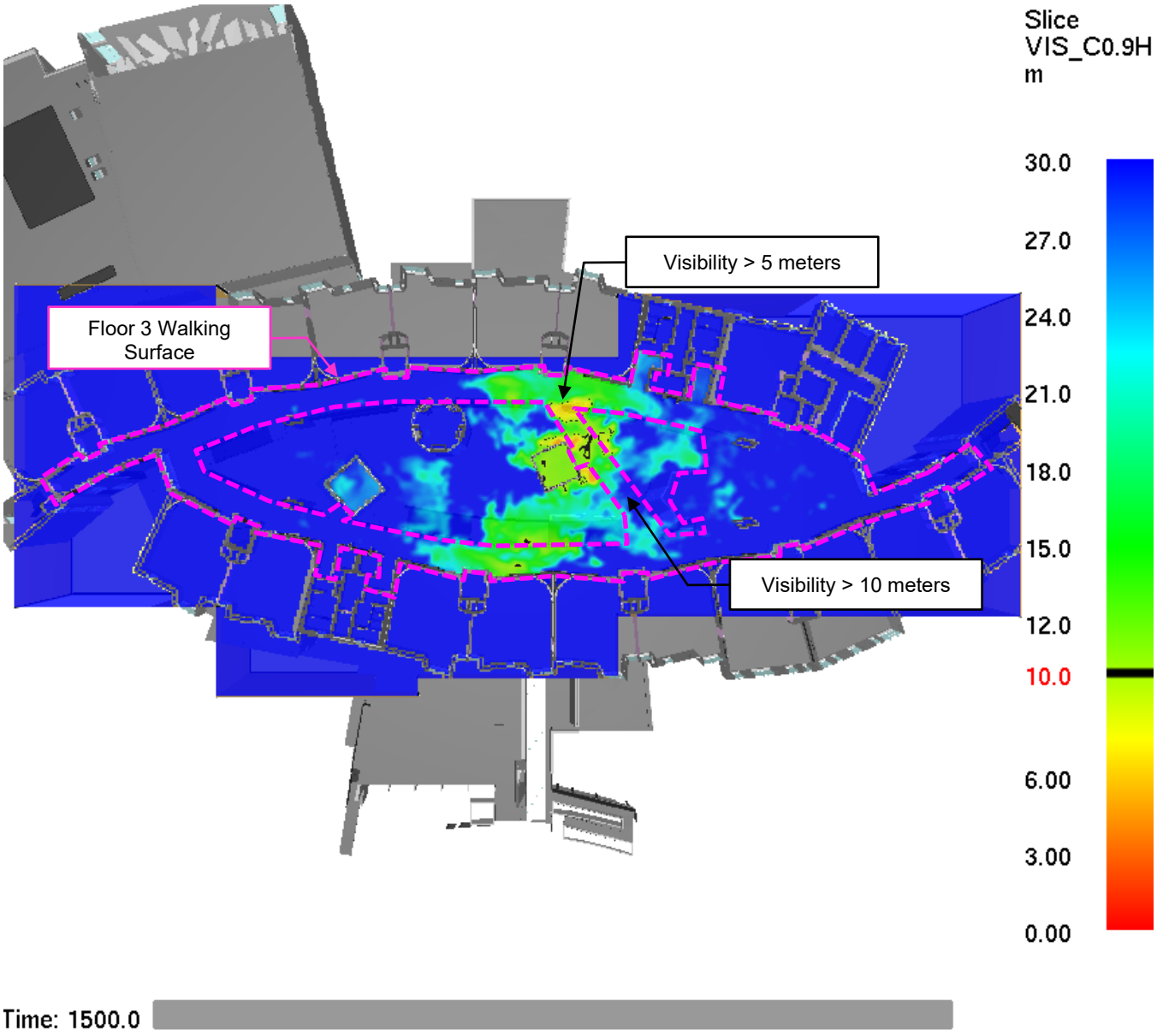


**Figure 28: Scenario 2 – Visibility 6 ft. above Floor 3 Walking Surface**

**Scenario 3 – 2,100 kW Balcony-Spill (Beneath Level 3 Walking Surface) Fire Results**

Scenario 3 consists of a balcony-spill plume 2,100 kW fire located beneath the Level 3 walking surface. The fire size is based on conservative assumptions and fire test data. The fire is allowed to grow to full size before sprinklers activate and control the fire, allowing it to remain at steady state. Such a scenario presents a very conservative assumption as such fires will decay once the fuel is burned up.

As required by the MSBC, the mechanical exhaust smoke control system must be designed and capable of maintaining tenable conditions 6 feet above the highest walking surface for a minimum of 20 minutes after fire detection or 1.5 times the calculated egress time, whichever is greater. The means of detection in Scenario 3 consists of beam detection located across the ceiling of the atrium. Beam detectors are spaced a maximum of 30-feet apart, and the model assumes an obscuration of 20%, such a setpoint is typical for beam obscuration detection. The use of this detection configuration does not preclude other means of detection such as an air sampling system, or spot-type smoke detection located along underside of the ceiling/roof, as such configurations would provide equivalent levels of detection modeled herein. As a result of such a modeled configuration, detection is noted to occur within 76 seconds. Therefore, tenability criteria for Scenario 3 is analyzed for a minimum of 1,276 seconds of simulation time, as this is greater than 1.5 times the calculated egress time (refer to Appendix C for additional information). The following subsections outlines the tenability results recorded for the duration of the scenario.

**SCENARIO 3 SMOKE TOXICITY RESULTS**

As discussed in the Design Assumptions section, carbon monoxide concentration levels were analyzed for the duration of the design fire. From the results, it is possible to determine the worst-case carbon monoxide (CO) concentration levels and where they occur within the occupied portions of the building. As the design fire progressed, concentration levels of CO six (6) feet above each occupied level were recorded with a maximum concentration level of less than 55.7 parts per million (PPM). See screen shots of the model below for illustrative results.

Using a maximum CO concentration of 55.7 PPM, the maximum exposure time before a human becomes incapacitated can be calculated. As discussed above, it is assumed a person may become incapacitated at COHb levels greater than 25-percent within the bloodstream. Using the calculations below, a person would need to be exposed to such conditions within the spaces for over 7.8 hours (468 minutes) during the design fire before they would become incapacitated from the effects of CO. This carbon monoxide concentration would provide occupants with more than enough time to evacuate the building and is considered acceptable conditions.

$$\%COH_b = (3.317 \times 10^{-5})(ppmCO)^{1.036}(RMV)(t)$$

$$(t) = \frac{\%COH_b}{(3.317 \times 10^{-5})(ppmCO)^{1.036}(RMV)}$$

$$(t) = \frac{25\%}{(3.317 \times 10^{-5})(55.7)^{1.036}(25)} = 468\,min$$

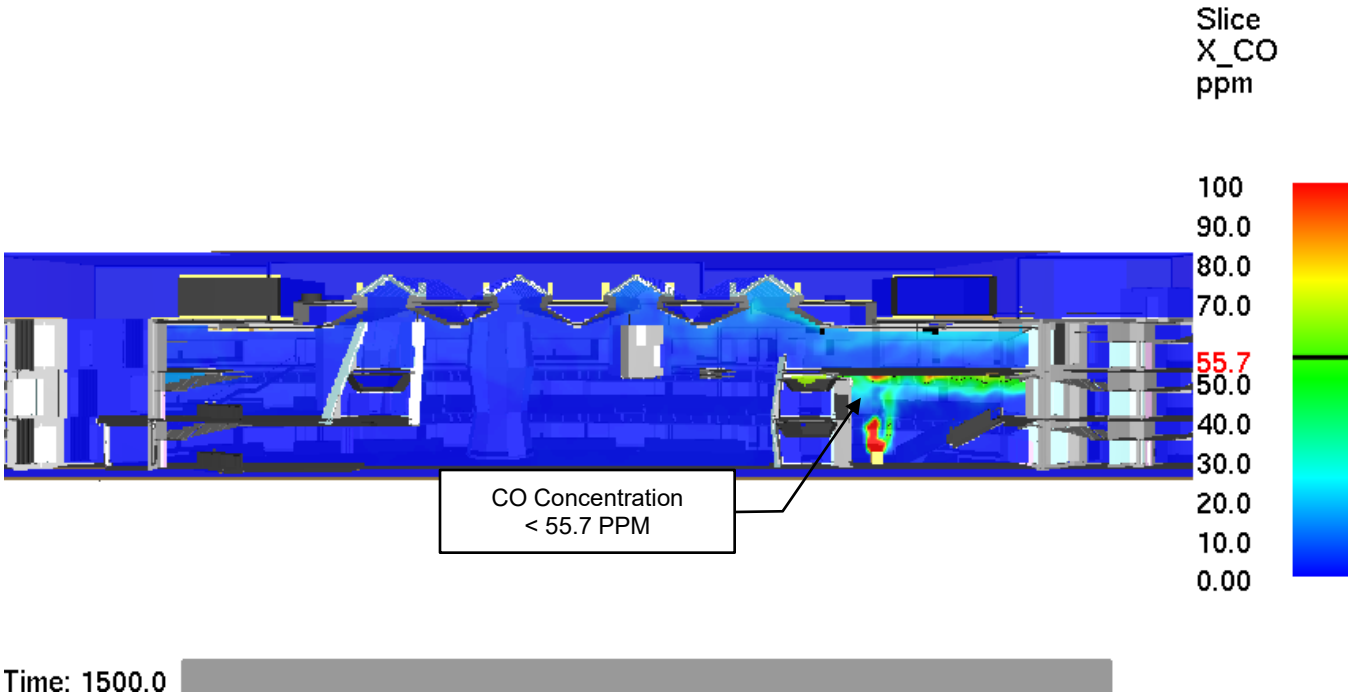


**Figure 29: Scenario 3 – Section View through Fire of CO Concentration**

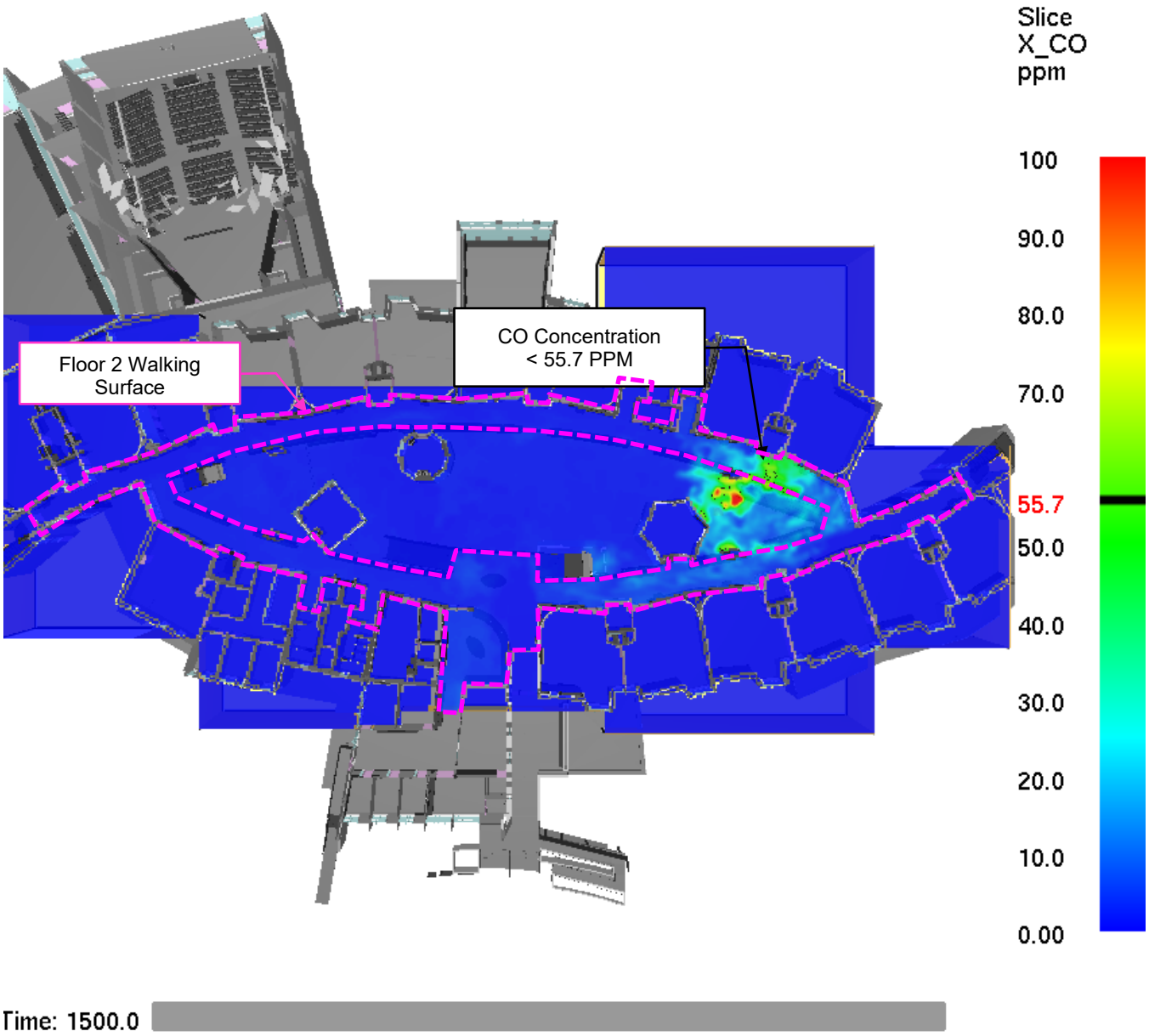


**Figure 30: Scenario 3 – CO concentration 6 ft. above** Floor 2 **Walking Surface**

## SCENARIO 3 HEAT EXPOSURE RESULTS

The second product of combustion analyzed within the FDS model was temperature. Beginning with an ambient temperature of 68°F, temperature levels were recorded throughout the atrium for the duration of the design fire to determine where the worst-case conditions occur.

As shown in the screen shot captured below, similar to the carbon monoxide concentration, the highest temperature levels occur along the Floor 2 walking surface underneath the Cohort Space. This can be expected because hot air is buoyant and will rise to the ceiling and descend towards the walking surfaces nearby the fire plume. As the design fire progressed, temperature levels continued to increase 6 feet above the walking surface with portions exceeding the maximum temperature level of 140°F. This occurs along the walking surface within the conical fire plume, in addition these elevated temperatures were intermittent. Occupants are capable of utilizing another exit without egressing through the fire plume. Since occupants are provided with other exits, and the average temperature in the atrium is below the 140°F threshold for human tolerance, and the portion exceeding 140°F was intermittent and intimate with the fire plume, the temperature levels are considered acceptable.

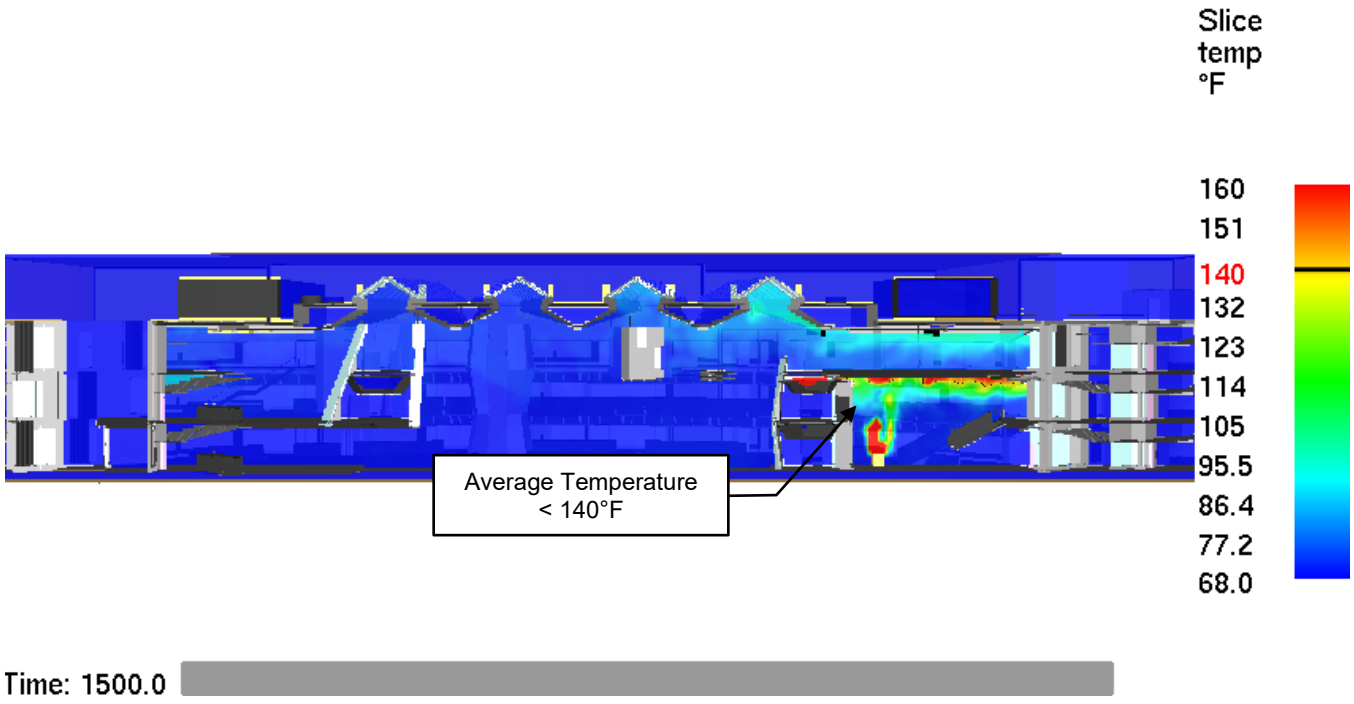


**Figure 31: Scenario 3 – Section View through Fire of Temperature**

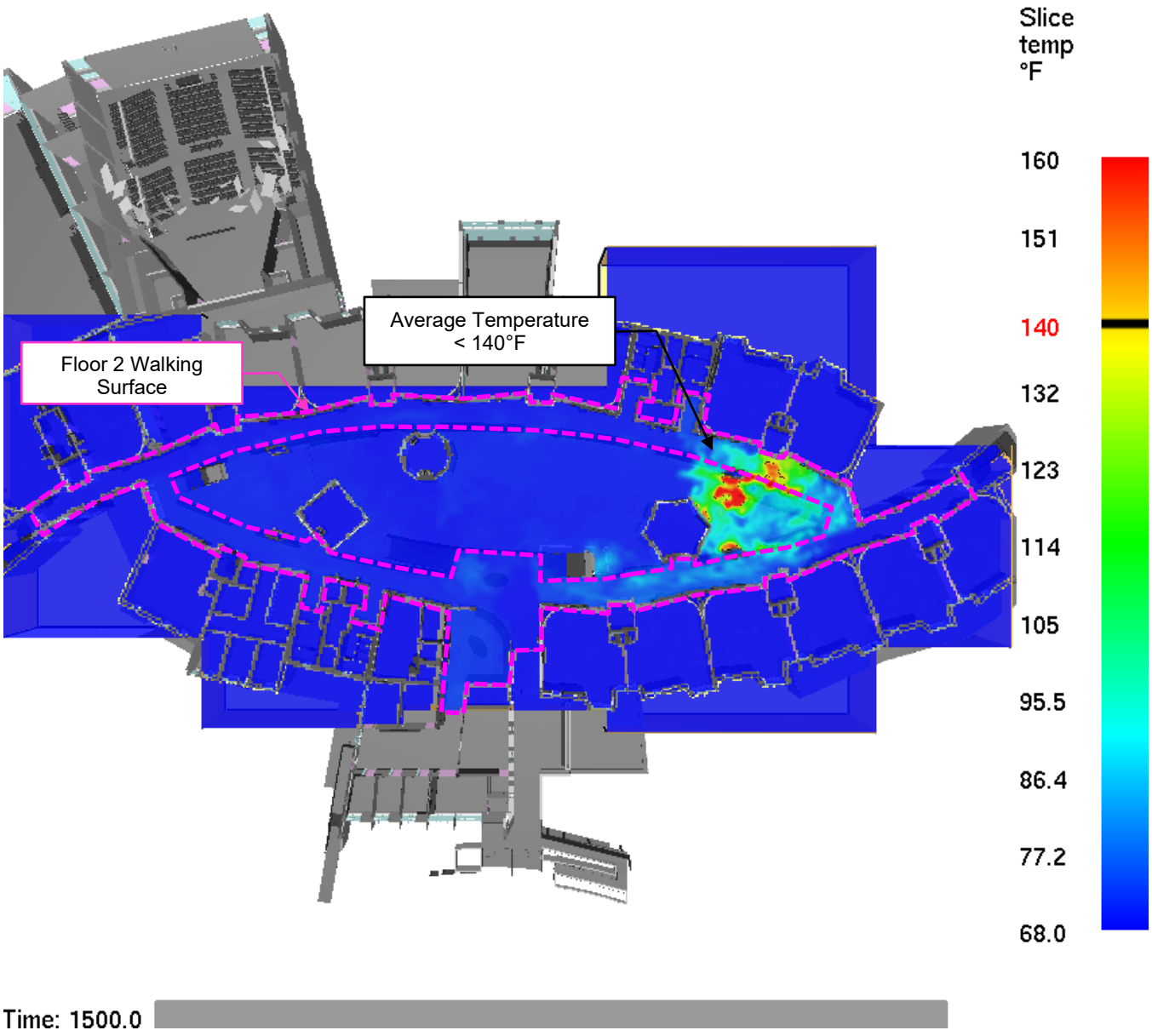


**Figure 32: Scenario 3 – Temperature 6 ft. above Floor 2 Walking Surface**

## SCENARIO 3 VISIBILITY RESULTS

Lastly, visibility conditions were analyzed and recorded within the FDS model throughout the atrium for the duration of the design fire to determine where the worst-case conditions occur. As shown in the screen shots captured below, visibility levels were maintained above the 10-meter tenability threshold over the majority of the means of egress system walking surface. There were small intermittent pockets of reduced visibility, although they were of short duration (less than 60 seconds) and intimate with the conical fire plume and for that reason are acceptable. The visibility levels calculated in the model are sufficient to see all walls and exit signs along the means of egress and is therefore considered acceptable conditions.

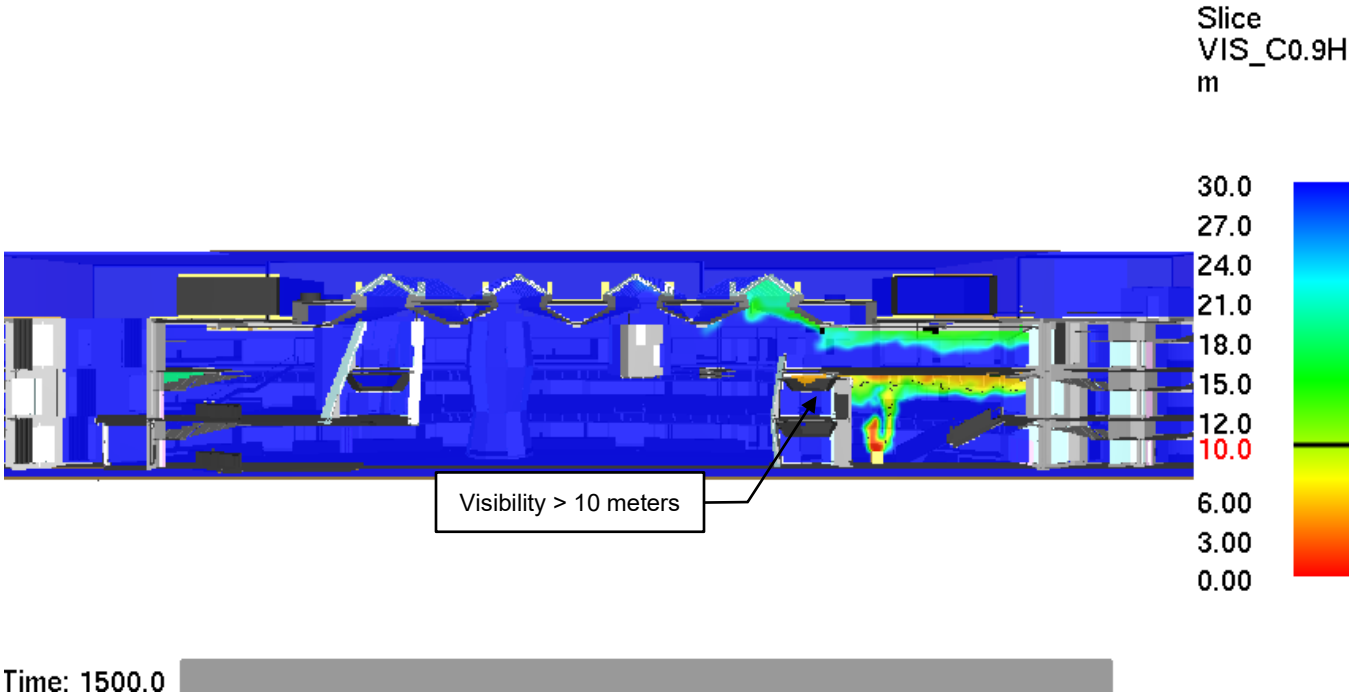


**Figure 33: Scenario 3 – Section View through Fire of Visibility**

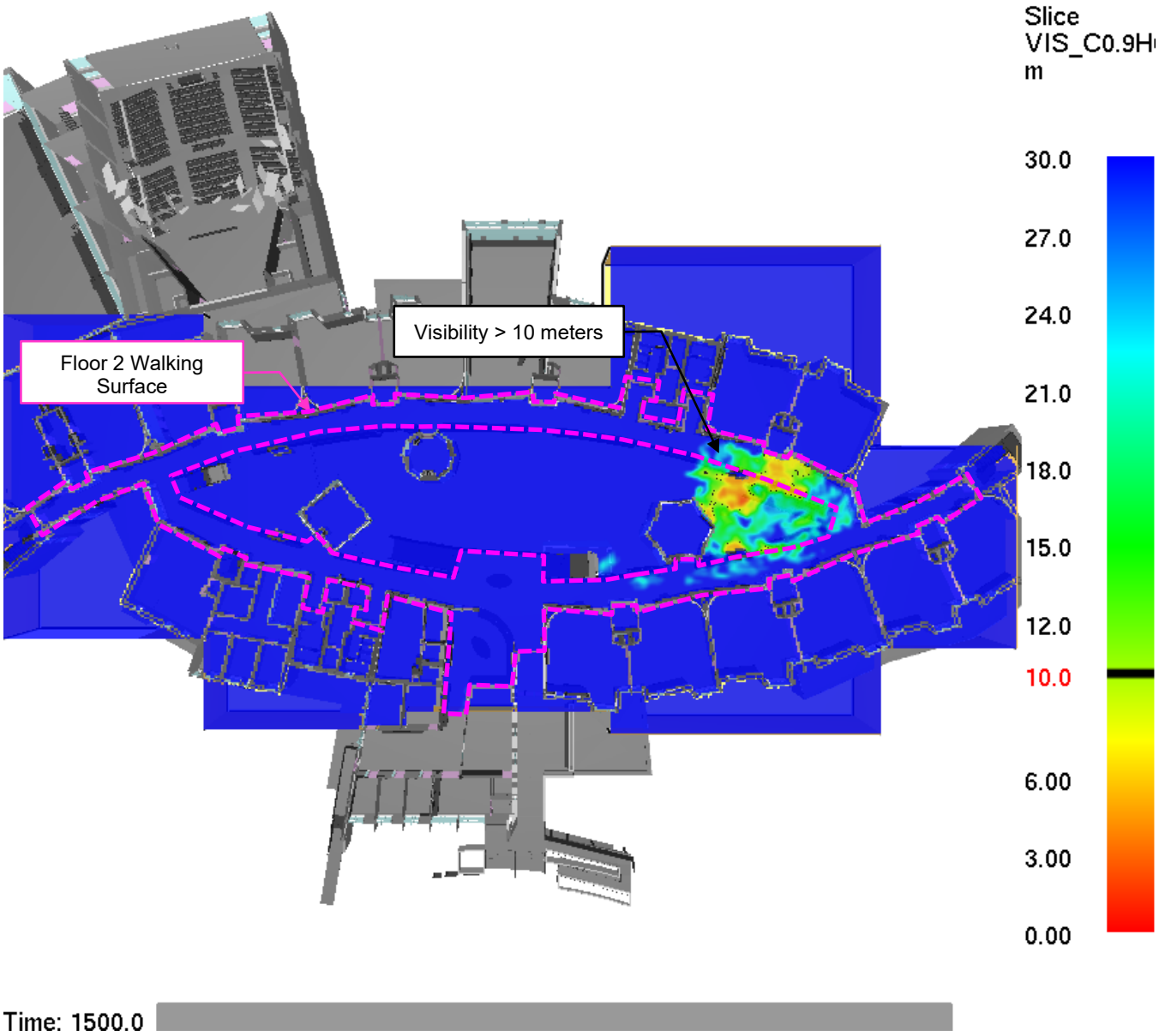


**Figure 34: Scenario 3 – Visibility 6 ft. above Floor 2 Walking Surface**

**Scenario 4 – 1,100 kW Balcony-Spill (Beneath Level 2 Walking Surface) Fire Results**

Scenario 4 consists of a balcony-spill plume 1,100 kW fire located beneath the Level 2 walking surface adjacent to the mechanical makeup air, automatic opening doors, and louvers (this location is subject to the highest makeup air velocities). The fire size is based on conservative assumptions and fire test data. The fire is allowed to grow to full size before sprinklers activate and control the fire, allowing it to remain at steady state. Such a scenario presents a very conservative assumption as such fires will decay once the fuel is burned up.

As required by the MSBC, the mechanical exhaust smoke control system must be designed and capable of maintaining tenable conditions 6 feet above the highest walking surface for a minimum of 20 minutes after fire detection or 1.5 times the calculated egress time, whichever is greater. The means of detection in Scenario 4 consists of beam detection located across the ceiling of the atrium. Beam detectors are spaced a maximum of 30-feet apart, and the model assumes an obscuration of 20%, such a setpoint is typical for beam obscuration detection. The use of this detection configuration does not preclude other means of detection such as an air sampling system, or spot-type smoke detection located along underside of the ceiling/roof, as such configurations would provide equivalent levels of detection modeled herein. As a result of such a modeled configuration, detection is noted to occur within 103 seconds. Therefore, tenability criteria for Scenario 4 is analyzed for a minimum of 1,303 seconds of simulation time, as this is greater than 1.5 times the calculated egress time (refer to Appendix C for additional information). The following subsections outlines the tenability results recorded for the duration of the scenario.

**SCENARIO 4 SMOKE TOXICITY RESULTS**

As discussed in the Design Assumptions section, carbon monoxide concentration levels were analyzed for the duration of the design fire. From the results, it is possible to determine the worst-case carbon monoxide (CO) concentration levels and where they occur within the occupied portions of the building. As the design fire progressed, concentration levels of CO six (6) feet above each occupied level were recorded with a maximum concentration level of less than 13.7 parts per million (PPM). See screen shots of the model below for illustrative results.

Using a maximum CO concentration of 13.7 PPM, the maximum exposure time before a human becomes incapacitated can be calculated. As discussed above, it is assumed a person may become incapacitated at COHb levels greater than 25-percent within the bloodstream. Using the calculations below, a person would need to be exposed to such conditions within the spaces for over 33.3 hours (2,002 minutes) during the design fire before they would become incapacitated from the effects of CO. This carbon monoxide concentration would provide occupants with more than enough time to evacuate the building and is considered acceptable conditions.

$$\%COH_b = (3.317 \times 10^{-5})(ppmCO)^{1.036}(RMV)(t)$$

$$(t) = \frac{\%COH_b}{(3.317 \times 10^{-5})(ppmCO)^{1.036}(RMV)}$$

$$(t) = \frac{25\%}{(3.317 \times 10^{-5})(13.7)^{1.036}(25)} = 2{,}002\ min$$

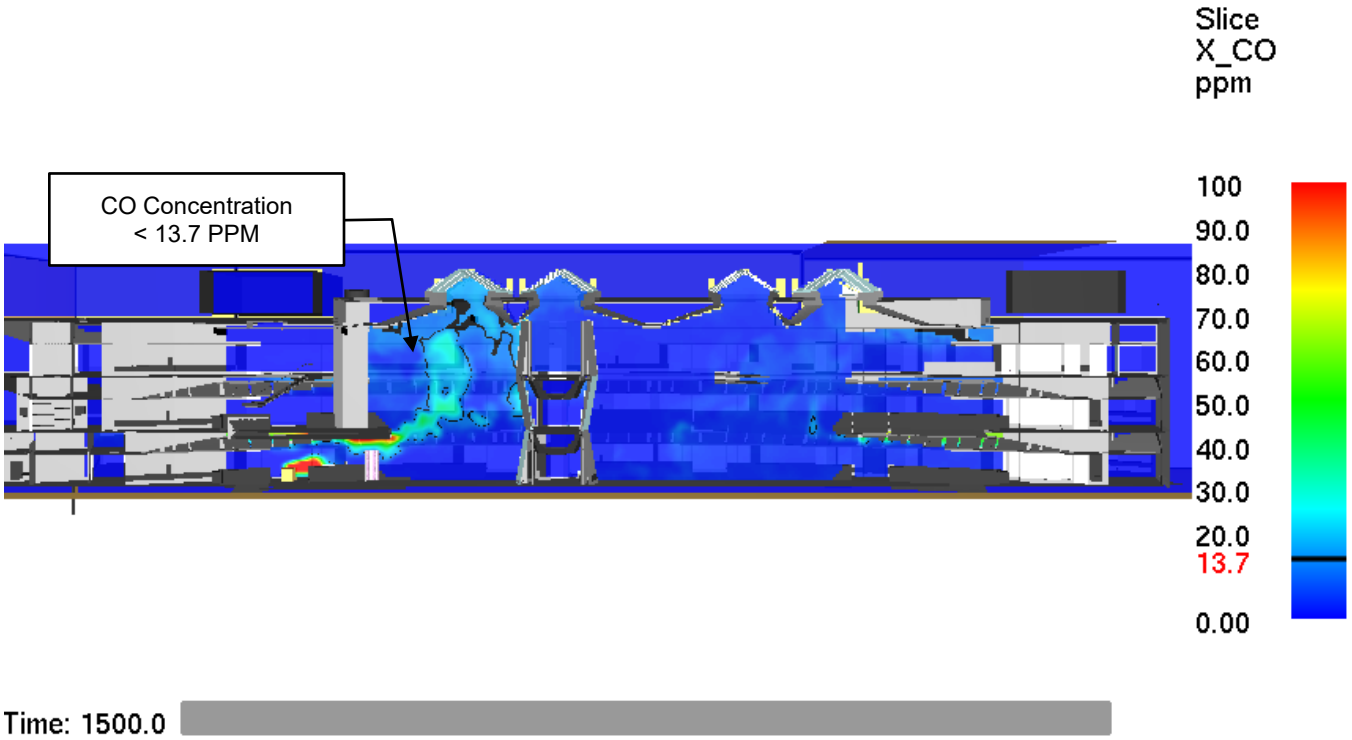


**Figure 35: Scenario 4 – Section View through Fire of CO Concentration**

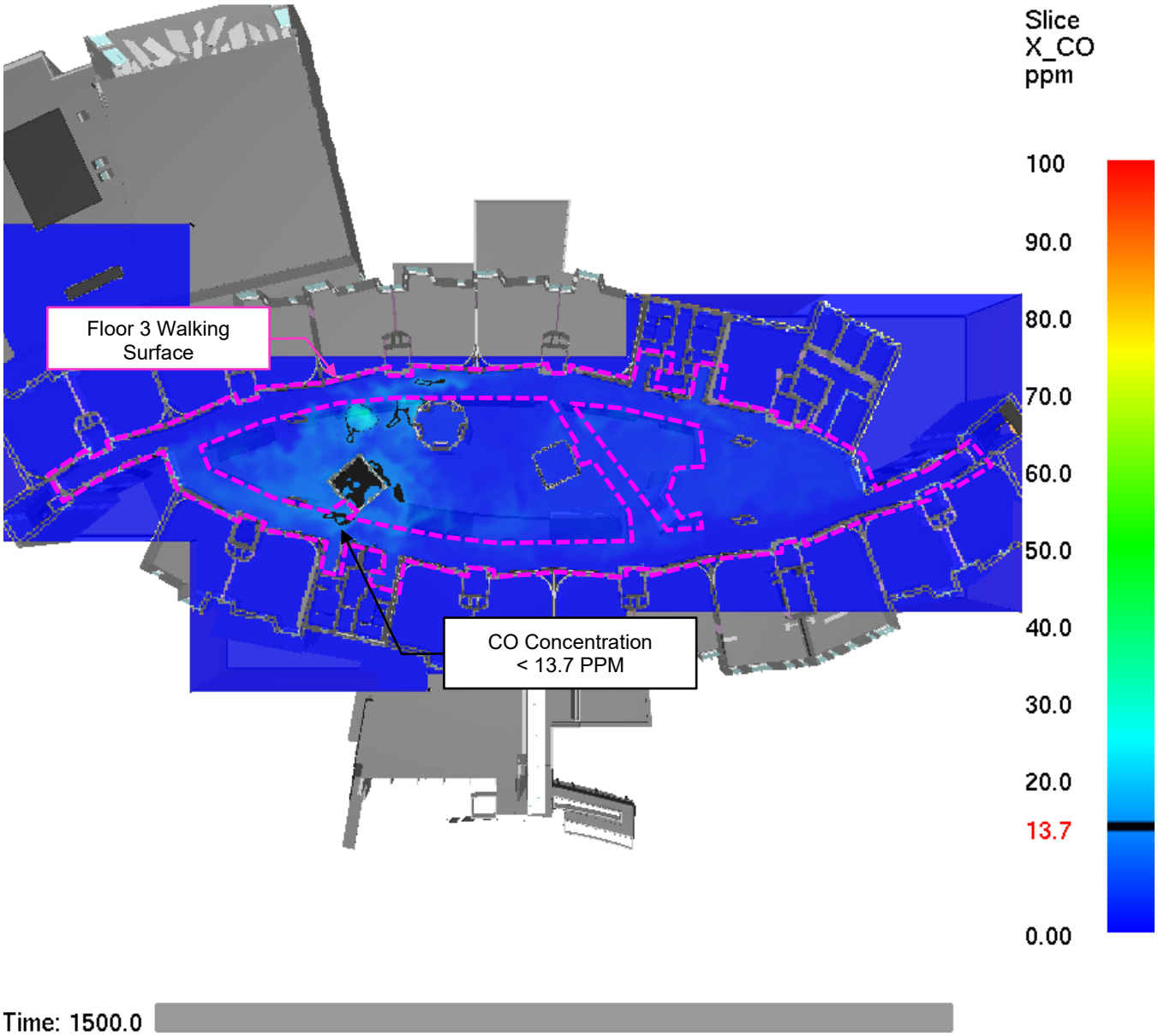


**Figure 36: Scenario 4 – CO concentration 6 ft. above Floor 3 Walking Surface**

## SCENARIO 4 HEAT EXPOSURE RESULTS

The second product of combustion analyzed within the FDS model was temperature. Beginning with an ambient temperature of 68°F, temperature levels were recorded throughout the atrium for the duration of the design fire to determine where the worst-case conditions occur.

As shown in the screen shot captured below, similar to the carbon monoxide concentration, the highest temperature levels outside of the fire plume occur at the highest levels of the atrium within the smoke filling space. This can be expected because hot air is buoyant and will rise to the ceiling. As the design fire progressed, temperature levels continued to increase with a maximum temperature of less than 140°F occurring 6 feet above highest walking surface. Since this temperature does not exceed the 140°F threshold for human tolerance and is considered acceptable conditions.

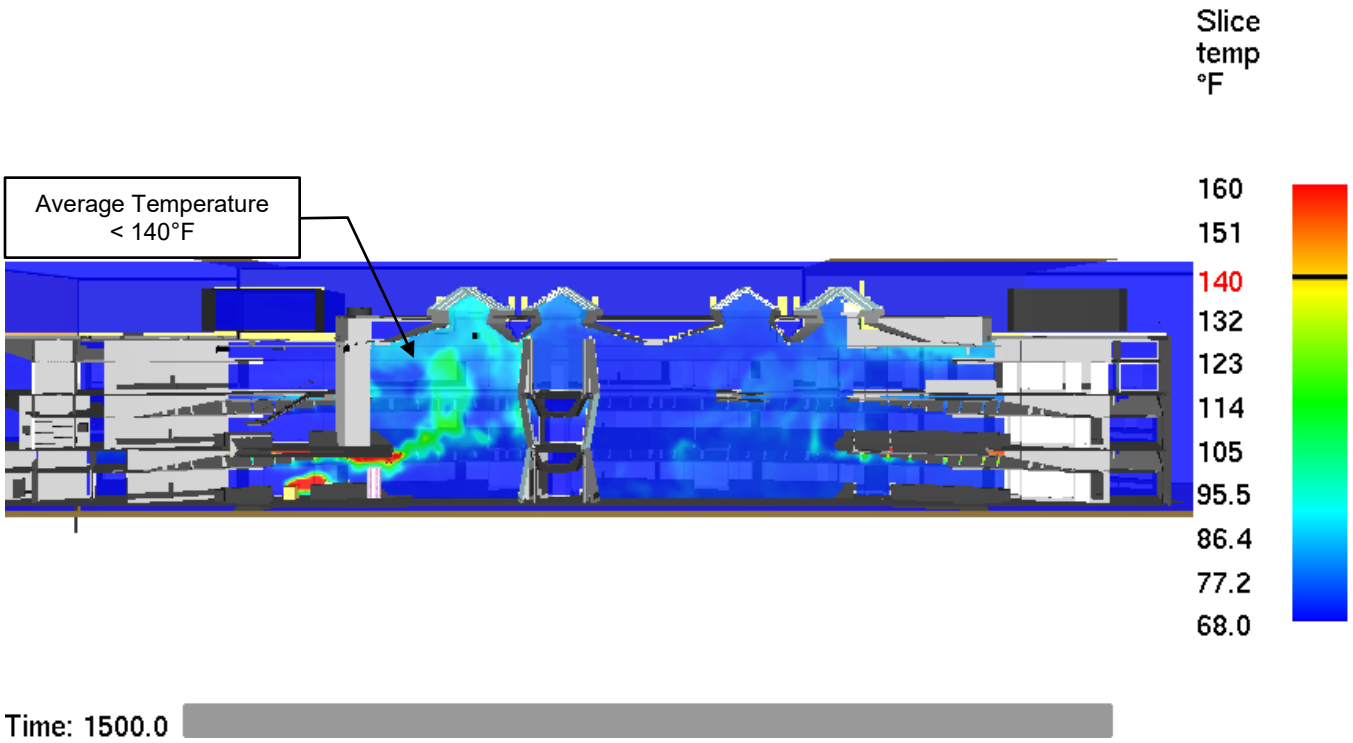


**Figure 37: Scenario 4 – Section View through Fire of Temperature**

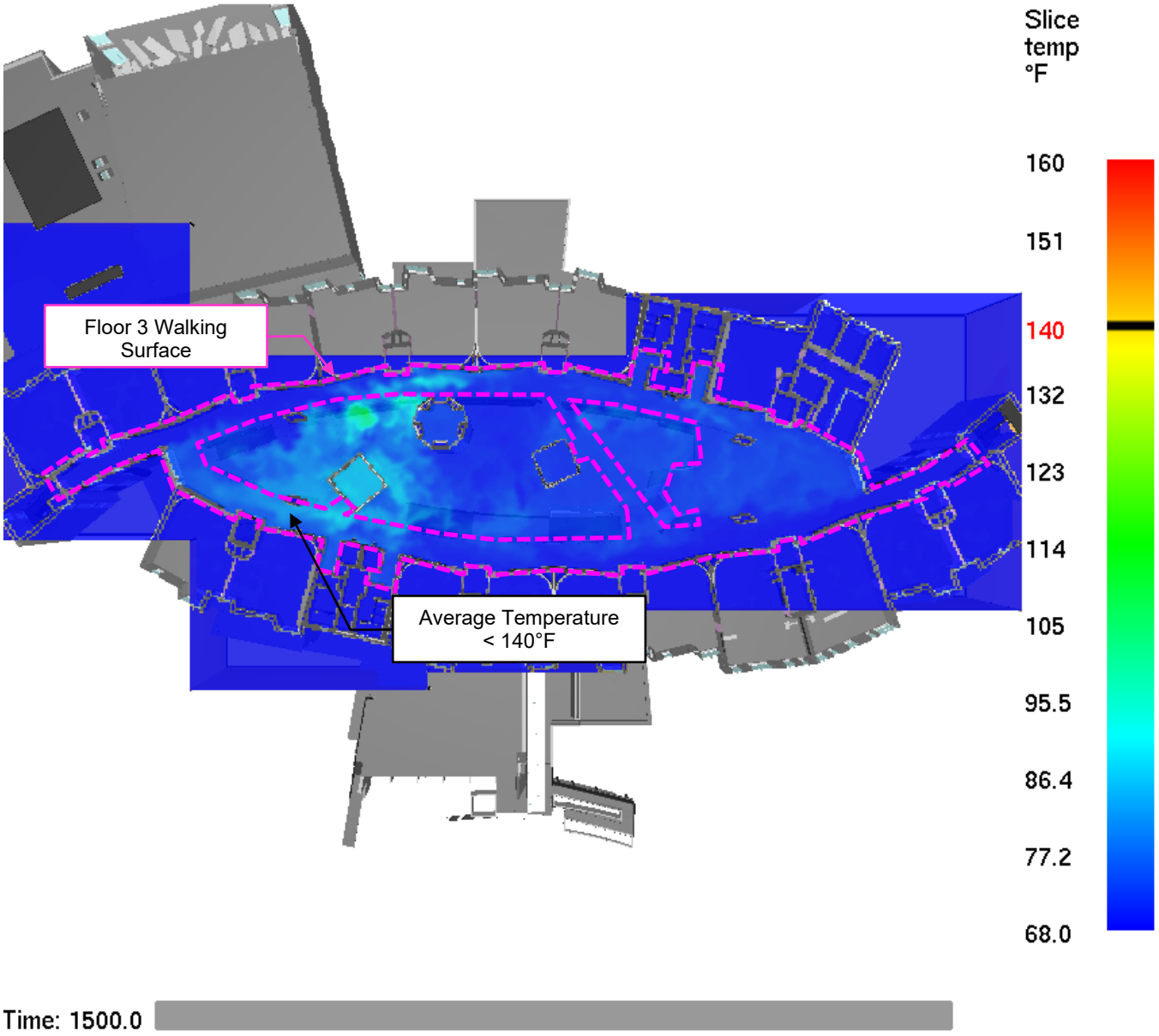


**Figure 38: Scenario 4 – Temperature 6 ft. above Floor 3 Walking Surface**

## SCENARIO 4 VISIBILITY RESULTS

Lastly, visibility conditions were analyzed and recorded within the FDS model throughout the atrium for the duration of the design fire to determine where the worst-case conditions occur. As shown in the screen shots captured below, visibility levels were maintained above the 10-meter tenability threshold outside of the fire plume in the large atrium spaces over the entirety of the means of egress system walking surface. The visibility levels calculated in the model are sufficient to see all walls and exit signs along the means of egress and is therefore considered acceptable conditions.

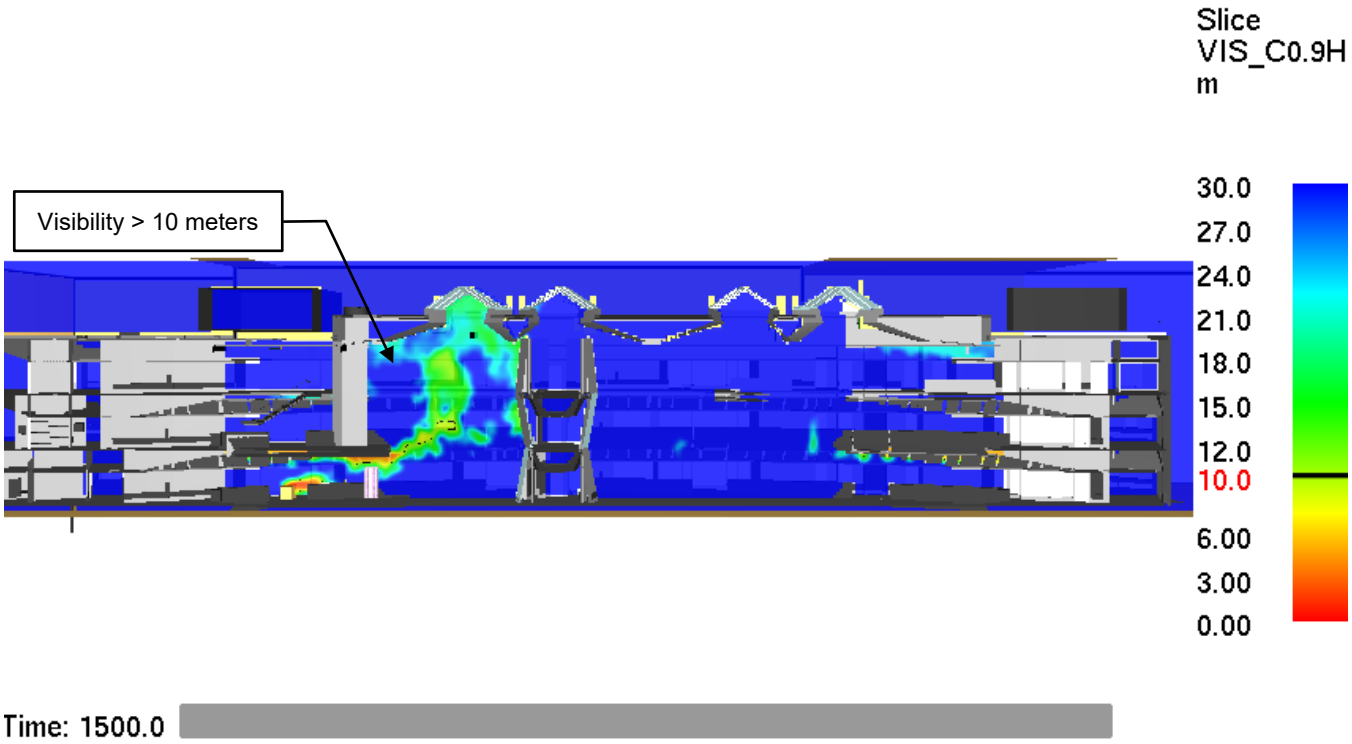


**Figure 39: Scenario 4 – Section View through Fire of Visibility**

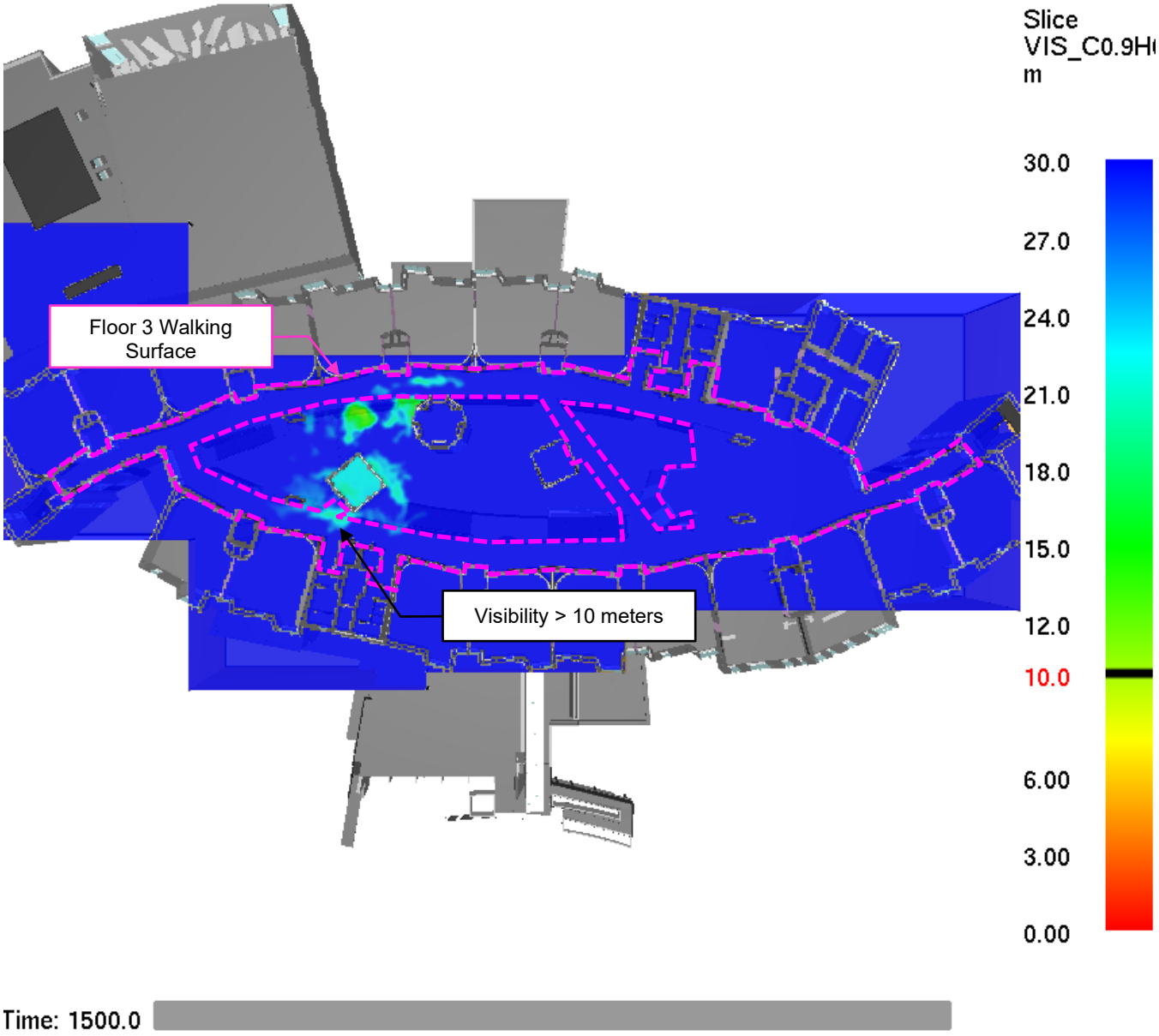


**Figure 40: Scenario 4 – Visibility 6 ft. above Floor 3 Walking Surface**

**Summary of Results**

This report analyzes the tenability environment for a proposed passive smoke control system for the atrium in the Framingham Fuller Middle School in Framingham, MA. The analysis evaluates a means of egress system, under specific fire scenarios, for three (3) major products of combustion during a fire scenario; heat exposure (temperature), smoke toxicity, and visibility. The FDS computer model developed by NIST was used to evaluate each of the tenability criteria. The CFD Model analysis validated the following smoke control systems design criteria.

- **Exhaust Configuration**
  - 240,000 CFM of mechanically driven exhaust air
    - Exhaust air is provided via multiple points (refer to Figure 1 and Figure 2).

- **Supply Configuration**
  - Floor 1 (refer to Figure 3):
    - Automatic Openings
      - Two (2) louvers providing a minimum of 63 $ft^2$ of free area each
  - Floor 2 (refer to Figure 4):
    - Automatic Doors / Openings
      - Three (3) exterior single-leaf doors and three (3) interior single-leaf doors providing a minimum of 66 $ft^2$ of free area
      - Two (2) louvers providing a minimum of 63 $ft^2$ of free area each
  - Floor 3 (refer to Figure 5):
    - Automatic Openings
      - Two (2) louvers providing a minimum of 63 $ft^2$ of free area each

Using the maximum carbon monoxide concentration found in all fire scenarios the maximum exposure time before a human becomes incapacitated can be calculated. The calculated exposure time as a result of the maximum CO concentrations was determined to be 7.8 hours (468 min), before a person would become incapacitated from the effects of CO. This concentration would provide occupants with more than enough time to evacuate the building and are considered acceptable conditions.

Heat exposure was analyzed with a maximum recorded average temperature along the means of egress system within the Atrium Zone not exceeded 140°F and is not considered hazardous to humans. Therefore, the design objective is achieved because every occupant is expected to be capable of evacuating the without being overcome by the harmful effects of heat exposure.

Visibility conditions were analyzed and found to be capable of maintaining the minimum visibility thresholds for the time duration necessary to safely evacuate occupants. As indicated in the results, the visibility threshold was maintained for a minimum of 20 minutes after detection of the fire. Therefore, the design objective is achieved because every occupant is expected to be capable of evacuating the building without experiencing low visibility conditions.

Although this analysis determined the atrium will maintain a tenable environment for the referenced design fires, several critical factors were overestimated and some not considered in this analysis, which contributed to providing a conservative analysis. These factors include:

- Sustained peak heat release rate for the duration of the model (Scenarios 1, 2, 3, and 4).
- Occupants are provided with multiple exits from the building,
- Overestimation of heat release rates based on the available fuel load,
- Delayed fire department and staff response/action (no manual suppression).

***ADDITIONAL INTERNATIONAL BUILDING CODE SECTION 909 RATIONALE***

**HVAC Systems**

Normal building HVAC systems, not associated with the smoke control system zone are designed to shut down when an automatic smoke detector, or sprinkler waterflow switch within the Atrium Zone is activated.

**Separation Distance**

Separation distances are required to be maintained between multiple fuel packages to reduce the possibility of adjacent fuel packages igniting during a fire, which may result in a fire larger than contemplated in the design. Separation distance requirements can be calculated using the equation below from MSBC Section 909.9.2.

$$R = \left(\frac{Q}{12\pi q"}\right)^{1/2}$$

Where:

R = Separation distance from target to center of fuel package (m)
Q = Heat release rate from fire (kW)
q" = Incident radiant heat flux required for non-piloted ignition (kW/m$^2$)

For the purposes of this analysis, an incident radiant heat flux of 10kW/m$^2$ was used, which is the heat flux required to ignite wood and the most commonly used combustible material within the atrium; and a fire size of 3,500 kW was used. The separation distances can then be calculated as follows:

$$R = \left(\frac{3{,}500}{12 \times \pi \times 10}\right)^{1/2}$$

*3.05 meters (approximately 10'0")*

As shown in the calculation above the separation between fuel packages within the atrium consisting of heat release rate of 3,500 kW shall be no less than 10'0".

**Stack Effect**

Stack effect is inherently calculated within the CFD models. The results indicate that the smoke will overcome the effects of stack effect and reverse stack effect during a fire event.

**Buoyancy**

Buoyancy is inherently calculated within the CFD models. The results indicate that the smoke will overcome the height of the space.

**Stratification Analysis**

Stratification is inherently calculated within the CFD models. The results indicate that the smoke will overcome the effects of stratification during a fire event.

**Climate**

Since the makeup air system relies on selected exterior openings to provide air into the Atrium Zone, it is imperative that the owner maintain the required exterior areas free from any impediments that would cause the doors/louvers not to open in an emergency. Specifically, the owner must maintain the surfaces outside all doors free from blockage anytime that the building is occupied so that the doors/louvers are capable of opening in smoke mode.

**Smoke Control Equipment Temperature**

MSBC Section 909.10 requires smoke control equipment including, but not limited to, fans, ducts, automatic dampers, and balancing dampers be suitable for its intended use under probable exposure temperatures. All exhaust fans must be UL 705 listed. Upper Hot Gas Layer Temperatures were analyzed within the FDS model. Beginning with an ambient temperature of 68°F, temperature levels were recorded throughout the Building for the duration of the design fire to determine where the worst-case conditions occur. Temperatures within the analyzed model(s) reached stead-state conditions, with maximum temperatures along the ceiling level calculated to be approximately 452°F. Refer to Figure 42 for a section view throughout the building.

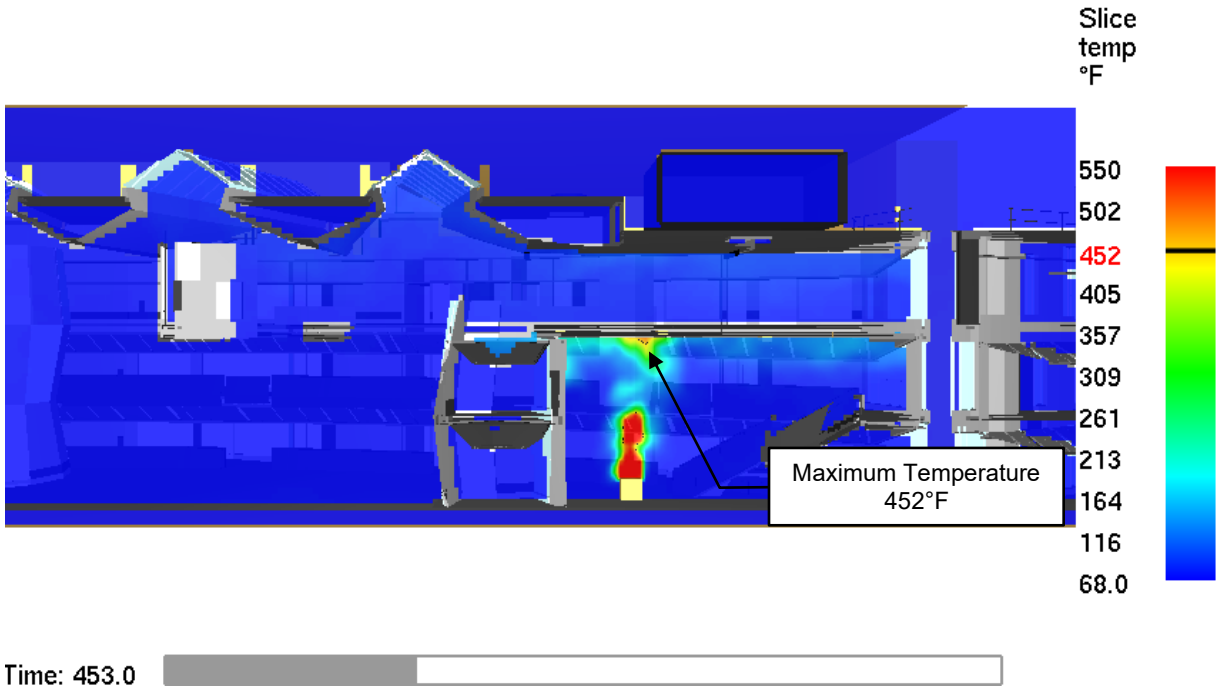


**Figure 41: Scenario 3 – Section View through Fire of Temperature**

## EQUIPMENT AND CONTROLS

Details of specific equipment, control sequences of actual equipment, fire alarm annunciation points, and HVAC operation as it relates to the smoke control system are found in the following sections of this report. All equipment shall conform to the requirements of the MSBC, NFPA 92, and UL 864.

The mechanical exhaust smoke control system will be activated automatically by appropriately zoned sprinkler systems within the Atrium Zone, smoke detection (i.e. via spot-type, beam obscuration or air-sampling system) located along the underside of the atrium skylights, or manually via the firefighter's smoke control panel. Upon activation of the fire alarm system within the appropriate zone, the smoke exhaust system shall be activated in accordance with the integrated operation matrix to be prepared by the Engineer of Record. The zone that will activate the smoke control system will be coordinated with the proposed Atrium Zone boundary as depicted in Appendix B.

### *SECONDARY POWER*

Secondary power must be provided and connected to all equipment associated with the smoke control system, which includes smoke control exhaust, automatic opening doors/louvers that are not fail-open used for makeup air, dampers, and any monitoring systems.

1. The emergency generator must be sized accommodate the demand of the smoke control system and equipment, automatic doors and dampers associated with makeup air, control panels, and controls for the smoke control sequence.
2. Transfer to full standby power must be automatic and occur within 60 seconds of failure of the primary power.

### *EQUIPMENT*

The following requirements relate to the smoke control equipment installed for exhaust or makeup air systems within the atrium.

1. Smoke-Control System Fans
    a. Smoke control fans are to be UL 864 listed.
    b. 1.5 times required number of belts (minimum 2) must be provided for belt-driven fans.
    c. Fan motors must have a minimum service factor of 1.15.
    d. Operation of fans in smoke mode will be confirmed by positive indication by either adjustable differential pressure sensors, adjustable current sensors, or airflow switches.
        i. Positive confirmation for smoke control fans is defined as the smoke control fan operating in its true ON condition. Where such a configuration is not achieved when required, a FAULT status must be displayed at the smoke control panel.
    e. Fans must be capable of operating under temperatures as predicted by the Smoke Control Rational Analysis.
2. Smoke-Control System Ducts
    a. All ductwork must be tested in accordance with MSBC Section 909.10.2.
        i. Duct leakage must be less than 5% of the design flow when tested to 1.5 times maximum design pressure.
        ii. Flexible connections for the purpose of vibration isolation shall be allowed in the exhaust system ductwork configuration, and are not required to be included within the duct leakage testing
    b. Air exhaust outlets must be located to minimize the potential for introducing smoke or flame into the building.
3. Smoke-Control System Smoke Dampers
    a. Each damper associated with the smoke control exhaust system must be provided with monitoring modules to provide positive indication of fully-open and fully-closed statuses.

i. Positive confirmation for smoke control damper is defined as the smoke control damper is positioned in its true OPEN or true CLOSED position. Where such a configuration is not achieved when required, a FAULT status must be displayed at the smoke control panel.

b. HVAC systems in the alarm zone not used for smoke control must shut down in accordance with the sequence of operations.

c. Dampers must be capable of operating under temperatures as predicted by the Smoke Control Rational Analysis.

d. Dampers on smoke control exhaust fans must be arranged to fail in the OPEN position.

e. Dampers on non-smoke control related equipment must be arranged to fail in the CLOSED position.

4. Automatic Doors/Louvers

a. The doors/louvers utilized for natural makeup air flow paths must be power operated doors/louvers to allow for makeup air infiltration from the adjacent spaces.

b. Each door/louver must be provided with monitoring modules for full open and closed statuses and control relays to ensure the door/louver operates appropriately.

i. Positive confirmation for doors and louvers that are used as part of the smoke control system is defined as the doors/louvers configured in the true OPEN or true CLOSED position. Where such a configuration is not achieved when required, a FAULT status must be displayed at the smoke control panel

ii. Each door leaf and louver must be provided with monitoring modules for fully open and fully closed statuses and control relays to ensure the door/louver operates appropriately for smoke mode.

c. If accessible switches are provided to shut power off to the doors/louvers, these switches must be monitored for position (report a fault on smoke control panel when disabled) or capable of being overridden by the smoke control system such that the doors/louvers are still capable of opening in smoke mode with the switch in the “disable” position.

d. Doors must be capable of opening and completing travel to the required smoke mode position within 75 seconds after receipt of an alarm signal.

e. It is recommended that a portion of automatic-opening interior makeup air doors/louvers open prior to operation of the smoke exhaust fans to prevent damage to the door motors.

5. Power Systems

a. The smoke-control systems must be supplied with two (2) sources of power. Primary power may be from the normal building power systems. Secondary power must be from an approved standby source complying with the National Electric Code. It must be confirmed that the generator is capable of supporting the power loads of the smoke control system. Refer to the Secondary Power section of the Smoke Control Rational Analysis for additional information.

b. Elements of the smoke control system relying on volatile memories must be supplied with uninterruptible power sources of sufficient duration to span 15-minute primary power interruption.

i. It is recommended that makeup air door/louvers control systems associated with the smoke control system are provided with an Uninterruptible Power Supply (UPS) to ensure the doors/louvers will open accordingly and position tracking is not lost during a loss of power event, which can prevent the doors/louvers from re-opening.

c. Elements of the smoke-control system susceptible to power surges must be suitably protected by power conditioners, suppressors or other approved means.

d. All power wiring serving the smoke control equipment, regardless of voltage, must be fully enclosed within continuous raceways.

e. **Power to all smoke exhaust fans, dampers and automatic opening makeup air doors/louvers (where provided) must be monitored <u>downstream</u> of any disconnects and VFD's (where provided) at the smoke control panel. This includes monitoring all points of disconnect.**
    i. Monitor all points of disconnect including VFD keypads (where provided), switchgear, local and remove disconnects, bypass switches, etc. Monitoring is not required if those points of disconnect can be automatically overridden by the smoke control system. This also includes monitoring of all points of disconnect for automatic door/louver openers and equipment serving makeup air doors/louvers.
    ii. If the smoke control equipment is disabled due to a service disconnect, breaker, bypass, VFD keypad (where provided), or override switch on makeup air doors/louvers, it must display a fault signal on the smoke control panel.

6. Control Systems
    a. All control equipment associated with the smoke control system equipment must be UL 864 listed. This includes the Firefighter's smoke control panel, fire alarm control panel, fans, damper controls, and door controls.
    b. Supervision for airflow sensing will be by differential pressure sensors, amperage monitoring relays, or airflow sensors. Required supervision will be indicated at the firefighter's control panel.
    c. All wiring, regardless of voltage, will be fully enclosed within continuous raceways (MC Cable is not permitted)
    d. Normal activation of the smoke-control system will be by automatic control.
    e. VFD's (where provided) must be locked out via a passcode or have key pad removed after commissioning of system. It should not be possible to adjust VFDs (where provided) while the system is in alarm mode.
7. Detection Systems
    a. The new equipment installed throughout the atrium (i.e. the exhaust fans and makeup doors/louvers) must be connected to, and monitored by the Fire Alarm Control Panel and Firefighter's Smoke Control Panel.
    b. The smoke control system must undergo a pre-programmed self-test automatically conducted by the fire alarm / smoke control system at a pre-determined time each week. The self-test must provide a printed report indicating the pass/fail of each equipment and overall system pass/fail status.
    c. An appropriately zoned sprinkler system that is coordinated with the location of the smoke control zones is required to be provided. The sprinkler waterflow switch serving each smoke control zone will be programmed to activate the smoke control system serving that zone, depicted in Appendix B.
    d. Appropriate smoke detection must be installed within the atrium at the ceiling level to activate the zoned smoke control system. This additional smoke detection may be beam detection, spot-type smoke detection, or air sampling system.

***FIREFIGHTER'S SMOKE CONTROL PANEL***

A new Firefighter's Smoke Control Panel must be provided to incorporate the necessary controls and indication for the new smoke control system within the atrium. The firefighter's Smoke Control Panel must be located adjacent to the Fire Alarm Control Panel (MSBC Section 909.16).

The firefighter's control panel must be provided with:

1. An Uninterruptible Power Supply so that it does not lose power in the event of building power failure.
2. Manual control or override of automatic control for smoke-control systems.
    a. The panel will graphically depict the building arrangement and smoke-control system zones served by the systems.

b. Graphically depict the location of fans, makeup air locations, major ducts and dampers within the building that are portions of the smoke-control systems.
   i. The Firefighter's Smoke Control Panel must provide a clear indication of the direction of airflow and the relationship of its components.

3. Control capabilities associated with the smoke control system will be as follows:
   b. "ON – AUTO – OFF" control over each individual smoke control component, which activates/deactivates all necessary fans and opens/closes related dampers and makeup air doors/louvers.
      i. If approved by the Authority Having Jurisdiction a single switch that controls all of the components required for the smoke control system to operate may be provided.
   c. Firefighter's control panel will take highest priority over all other building sources.
   d. The controls and indicators will be combined to control and indicate all elements of the smoke zone as one unit.
4. On the graphic zone panel, status lamps will be provided for the indication of operation of all smoke-control equipment within each smoke zone as a single unit as follows:
   a. Fans, dampers, makeup air openings, and other operating equipment in their NORMAL status - White.
   b. Fans, dampers, makeup air openings, and other operating equipment in their ON or OPEN mode - Green.
   c. Fans, dampers, makeup air openings, and other operating equipment in FAULT mode - Yellow.
   d. Fans, dampers, makeup air openings, and other operating equipment in OFF (or CLOSED) mode - Red.

***SEQUENCE OF OPERATION***

The smoke control zone will be activated automatically and independently by sprinkler water flow switches (sprinklers zoned within the Atrium Zone Boundary), smoke detection (i.e. via spot-type, beam obscuration or air-sampling system) located along the underside of the atrium roof, or manually via the firefighter's smoke control panel (location to be determined). Refer to Appendix B which depicts the Atrium Zone Boundary.

Upon activation of the fire alarm system, the smoke control system shall be activated in accordance with the operation matrix prepared by the Engineer of Record for the mechanical system at the time of original building construction. These operations include shutdown of normal HVAC within the Building, activation of the smoke exhaust fans, and opening the makeup and doors and louvers.

Upon receipt of an alarm signal, all smoke control equipment must report true positive status (doors, louvers, and dampers report to open status, exhaust fan 100-percent run) within 135 seconds. Makeup air doors/louvers shall open prior to prevent damage to the door motors. Exhaust fan dampers shall open prior to the fan running at 100-percent operation to prevent damage to the damper actuator and capitation of the exhaust fan. System shall be fully operational within 135 seconds of the detection of a fire within the atrium smoke zone.

**Table 5: Sequence of Operation**

| Sequence | Event | Duration |
|---|---|---|
| 1 | Time for Dampers and Doors to Reach Full Open Position | 75 Seconds maximum |
| 2 | Time for Exhaust Fan to Ramp Up and Achieve 100 percent Run | 60 seconds maximum |
| | **System Running at Full Capacity (after detection):** | **135 Seconds maximum** |

*Note: Fire detection time is dependent upon fire scenario. Detection time has been determined within the FDS scenarios, and subsequently the indicated sequence of operation occurs. Detection through sprinkler activation requires an additional 90 seconds to transmit the waterflow signal to the fire alarm control panel.

**SPECIAL INSPECTION AND TEST REQUIREMENTS**

In addition to the ordinary inspection and test requirements, smoke control systems are required to undergo special inspections and tests sufficient to verify the proper commissioning of the smoke control design in its final installed condition. The Special Inspector is responsible for verifying that the smoke control system is installed in accordance with the requirements of MSBC Section 909 and that the system achieves the performance defined in the Smoke Control Rational Analysis Report.

The Special Inspector must be employed by the Owner, Owner's Agent, Architect, or Engineer of Record. The Special Inspector must not be employed by the contractor or any other person responsible for the work being installed/performed. The Special Inspector must be a qualified person that can demonstrate competence to the satisfaction of the Building and Fire Department for the inspection and testing of smoke control systems, having expertise in fire protection engineering, mechanical engineering and certification as air balancers (MSBC Section 1705.18.2). Where necessary, testing agencies required by the Special Inspector must be engaged by the Owner or Owner's Agent. Testing agencies that measure HVAC performances (Testing and Balancing agencies) must be certified by the Associated Air Balance Council (AABC) or the National Environmental Balancing Bureau (NEBB). The Testing Agency must also produce documentation that all equipment used to test and balance the smoke control system has been calibrated in accordance with AABC or NEBB.

The smoke control system is required to be inspected and tested in accordance with MSBC Section 909.18.8. Special inspection and testing requirements shall include, at a minimum, the following:

1. The special inspections and tests shall be sufficient to verify the proper commissioning of the smoke control design and to determine the final installed condition is in compliance with the design documents and requirements of the NFPA 92 and the MSBC. Where determined necessary by the local jurisdiction, tests must be conducted in the presence of an authorized representative from the Department of Building Inspections and the Fire Department. Such parties are to be notified of testing to determine their availability and reschedule if necessary. A report of the results must be submitted to both Departments.
2. All smoke control ductwork must be tested for leakage. Duct leakage must be less than 5-percent of the design flow when tested to 1.5 times maximum design pressure. Note, all duct leakage testing must be witnessed by the Smoke Control Special Inspector prior to concealment of ductwork within walls/ceilings.
3. In accordance with IBC Section 909.12.1, NFPA 92 and UL 864 an automatic pre-programmed weekly self-test of the smoke control system must be provided within the system design. The functionality of this pre-programmed test will be required to be reviewed and documented by the smoke control special inspector. In addition, weekly records should be kept on site and a semi-annual test under standby power will be required.

Additionally, after occupancy of the building, all operating parts of the smoke-control systems must be retested every six (6) months in accordance with the retest requirements established by the Engineer of Record, Smoke Control Special Inspector retained at the time of initial commissioning, and with concurrence from the Department of Building and Safety and the Fire Department. The test should be conducted by an approved inspection agency or by the owner or the owner's representative when so approved by both Departments. A report of the test results should be submitted to both Departments.

***OVERVIEW***

Three types of testing exist for the smoke control system in the atrium. These three types of the tests are:

1. Component System Testing
   a. Component System Testing shall be complete prior to any acceptance testing is to be conducted. The contractor shall certify that all component systems have been checked and are fully operational and meet all design specifications and applicable codes before acceptance testing begins.
   b. This shall include inspection and review by the Smoke Control Special Inspector of all ductwork serving the smoke control system prior to concealment of ductwork within walls/ceilings. Ductwork must be tested in accordance with MSBC Section 909.10.2. Duct leakage must be less than 5-percent of the design flow when tested to 1.5 times maximum design pressure. Flexible connections for the purpose of vibration isolation shall be allowed in the exhaust system ductwork configuration and are not required to be included within the duct leakage testing
2. Acceptance Testing
   a. Acceptance Testing takes place before a certificate of occupancy is obtained. Acceptance Testing will test the integrated smoke control system to confirm compliance with the design specifications and proper operation. Pass/Fail criteria for acceptance testing are outlined later in this section.
   b. This shall include pressure difference testing, flow measurements and detection and control verification for all equipment serving the smoke control system, as well as reviewing the reliability of the monitoring system and controls at the Firefighter's Smoke Control Panel.
3. Periodic Testing and Maintenance
   a. Weekly pre-programmed self-test automatically conducted by the fire alarm / smoke control system at a pre-determined time each week, with printed report indicating the pass/fail of each equipment and overall system pass/fail status.
   b. To be conducted by the owner semi-annually to ensure proper operation after certificate of occupancy is obtained.

***COMPONENT AND ACCEPTANCE TESTING CONDITIONS***

The following tasks shall be completed prior to starting any smoke control system testing:

1. All ductwork must be testing in accordance with MSBC Section 909.10.2. Duct leakage must be less than 5-percent of the design flow when tested to 1.5 times maximum design pressure. Flexible connections for the purpose of vibration isolation shall be allowed in the exhaust system ductwork configuration and are not required to be included within the duct leakage testing. Note, all duct leakage testing must be witnessed by the Smoke Control Special Inspector prior to concealment of ductwork within walls/ceilings
2. All building equipment shall be placed in normal operations mode.
3. The smoke control system will be demonstrated for proper operation sequences without smoke.
4. Smoke control systems shall be activated manually from the fireman's control panel to verify proper operation for each smoke control zone.
5. Smoke control systems will be activated automatically by activation of sprinkler water flow switches, heat detectors, area smoke detectors or duct smoke detectors.
6. The engineer conducting the testing shall record the following:
    a. Time
    b. Date
    c. Location of Test
    d. Outside Weather Data (including wind speed, direction and temperature)
    e. Inside Weather Data (including wind speed, direction, and temperature)
    f. Initial pressure differences between inside and outside, if any
    g. Number of doors initially open and initially closed
    h. Status of HVAC system for the Building (ON/OFF)
7. Active firefighting equipment shall be available on site prior to any tests being conducted.
8. The building's life safety systems shall be fully operational and checked out for any errors. The Fire Alarm Control Panel shall be free of all alarm and trouble conditions that the engineer believes may pose a conflict with the testing. All exit signs and means of egress marking shall be in place and functioning properly.

***PASS CRITERIA***

All of the following criteria must be achieved during the same test for the Smoke Control System to be considered passing:

1. Activation of a sprinkler water flow switch serving the smoke zone being tested automatically activates the proper life safety and smoke control functions.
2. Designed air quantities are being delivered within 135 sections of fire alarm activation, or within a timeframe specified by determined by the Smoke Control Special Inspector or Authorities Having Jurisdiction.
3. Designated fire doors close at zone boundary within 75 seconds of fire alarm activation, or within a timeframe specified by determined by the Smoke Control Special Inspector or Authorities Having Jurisdiction.
4. Designated makeup air windows/louvers open within 75 seconds of fire alarm activation, or within a timeframe specified by determined by the Smoke Control Special Inspector or Authorities Having Jurisdiction.
5. Audible and visual fire alarm signal function in accordance with the requirements of the Code.
6. Smoke control systems activate in accordance with the sequence of operations when activated from the firefighter's smoke control panel (location to be determined).

7. Required dampers and fire doors close automatically without assistance of human beings.
8. Life Safety systems operated correctly while under emergency power.
9. Emergency power operates life safety systems (simulate a loss of normal building power while testing life safety systems).
10. Fire alarm and smoke control systems operate correctly on the fire floor when activated manually or automatically.
11. Doors at the zone boundaries are operable within the code requirements for opening forces.
    a. Doors that are closed during the sequence of operation at zone boundaries can be opened and re-closed while fans are functioning.
    b. The system is not designed to maintained pressure differences when the doors are open and the opening of doors during the test is not required.

***FAILURE CRITERIA***

If any of the following items occur during the test, the test is immediately considered failing.

1. Smoke control equipment does not operate or function.
2. Fire alarm system fails to activate the smoke control system.
3. Fans and related systems do not operate when activated manually at the firefighter's smoke control panel.
4. System does not meet the pass criteria above.
5. Smoke control equipment (dedicated and shared air distribution fans, dampers etc.) does not provide the required air quantities shown on the mechanical engineer's design documents.
6. System fails to return to normal mode when manual override is signaled.
7. Systems fail to function on emergency power.
8. Required doors, louvers, and dampers fail to open (as required).
9. Required doors, louvers, and dampers fail to close (as required).

***PERIODIC TESTING REQUIREMENTS***

Once the smoke control system has been fully commissioned, it is required to be maintained and comply with the periodic testing and maintenance requirements of IBC, IFC, NFPA 92, and UL 864

1. In accordance with MSBC Section 909.12.1, NFPA 92, and UL 864 an automatic pre-programmed weekly self-test of the smoke control system must be provided within the system design. The functionality of this pre-programmed test will be required to be reviewed and documented by the smoke control special inspector. In addition, weekly records should be kept on site and a semi-annual test under standby power will be required.
2. The smoke control system is required to be inspected and tested semi-annually in accordance with MSBC Section 909.18.8. Semi-annual testing must be performed to sufficiently verify that the smoke control system is properly maintained and still functions and performs in accordance with the final commissioning report prepared by the smoke control special inspector. Testing shall identify the current status of the system, indicate any deficiencies and provide recommendations for correcting such deficiencies. Such information should be kept on site and available for review.

## CONCLUSION

This analysis utilized a mechanical smoke control system to maintain tenable conditions along the means of egress system throughout the Framingham Fuller Middle School atrium. This rational analysis demonstrates that tenable conditions are maintained at least 6 feet above any walking surface that forms a portion of the required atrium means of egress system for the evacuation of occupants (MSBC Section 909.8) when protected by the smoke control system outlined herein.

The rationale presented within this report is in accordance with the Massachusetts State Building Code and NFPA 92, and demonstrates compliance with the intent of the Code, which is to maintain tenable conditions along the means of egress during a fire event for a minimum of 1.5 times the required safe egress time, or 20 minutes after detection, whichever is greater (MSBC Section 909.4.6).

## APPENDIX A – HEAT RELEASE RATES

This section of the report contains numerous examples of heat release rates expected from a variety of fuels commonly found in assembly occupancies such as this building. These heat release rates have been utilized to evaluate the trial designs and system performance contained in the analysis section of this report.

Figure 42 presents the results of five (5) kiosk fire tests, each with a different configuration including variations in T-shirt arrangement, composition of T-shirts, dimensions of kiosk, materials of the kiosk, variations in air current near the kiosk. Although the configurations of each test were different, the heat release rate curves were very similar, and in no case did the fuel load produce a heat release rate exceeding 2,000 BTU/s.

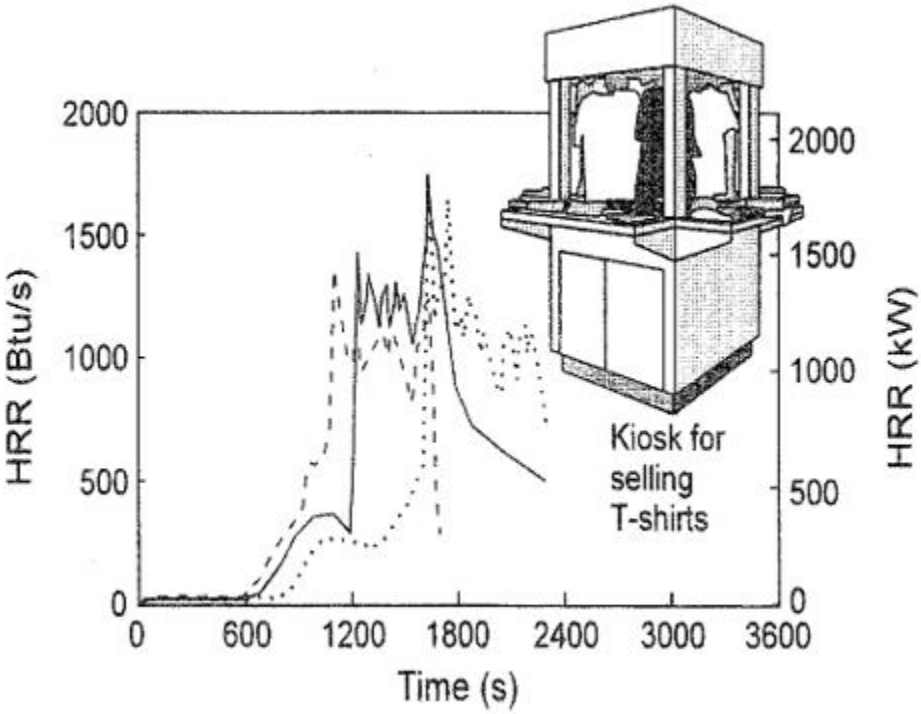


**Figure 42: Kiosk Heat Release Rates with Variations**

Using a fast growth, 2,000 kW steady state fire is generally considered larger than the fuel load found anticipated for a kiosk/display, and would likely exceed the expected fuel load contained on the space during a typical event.

**Example: Two-Panel Workstation Fire**

The results of the fire tests for the “Two Panel Workstation Fire” provided a peak heat release rate of 1,749 kilowatts (kW) at a time of 5 minutes. The ignition source for the fire was located below the desk adjacent to the office chair, such as could occur when using a power strip located on the floor. The duration of the fire from ignition to consumption of fuel/burnout was 42 minutes. Figure 43 illustrates the heat release rate as a function of time.

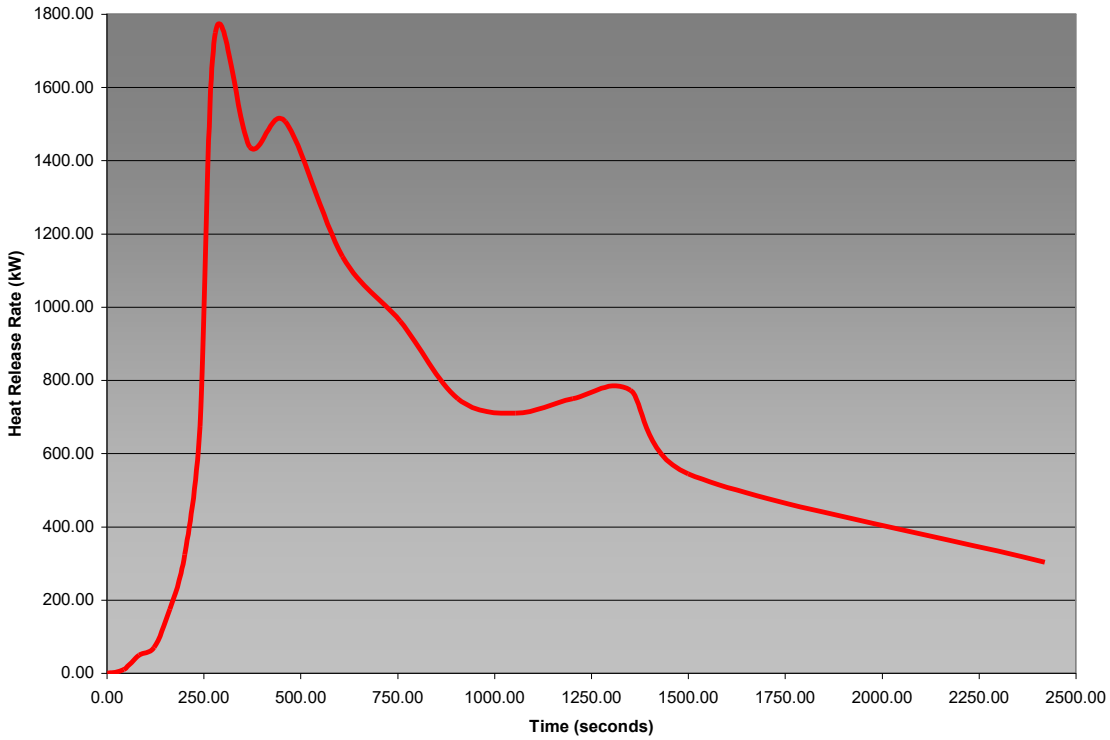


**Figure 43: Heat Release Rate vs. Time (Individual Two-Panel Workstation Fire)**

Figure 44 through Figure 48 illustrate the development of the Two-Panel Workstation fire, as observed during the testing performed by NIST, at various stages of fire progression.

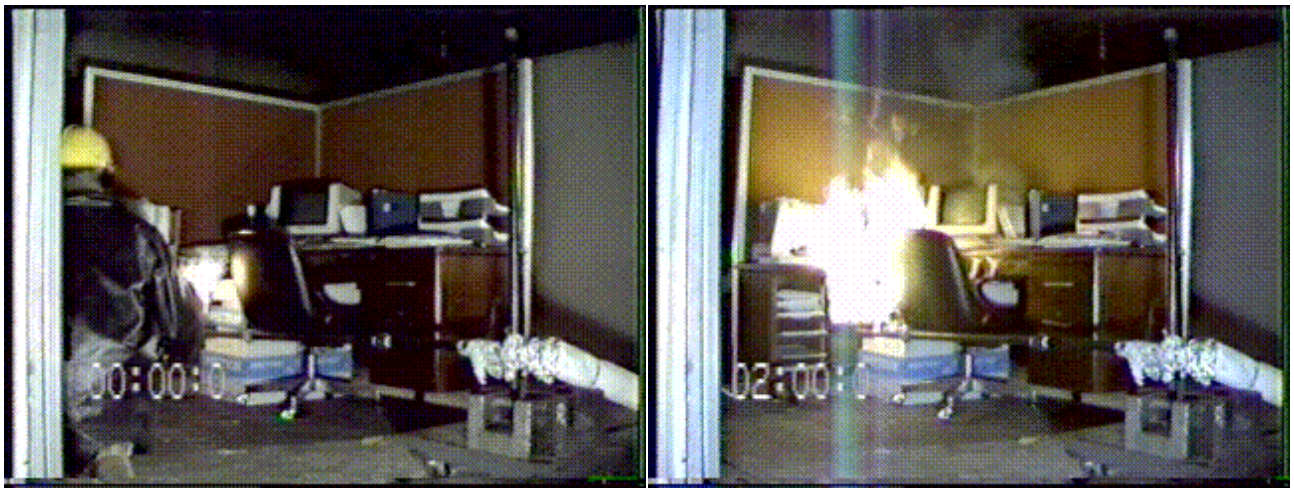

**Figure 44: Two Panel Workstation fire at time 0:00 and 2:00 minutes**

**Figure 45: Two Panel Workstation fire at time 4:00 and 6:00 minutes**

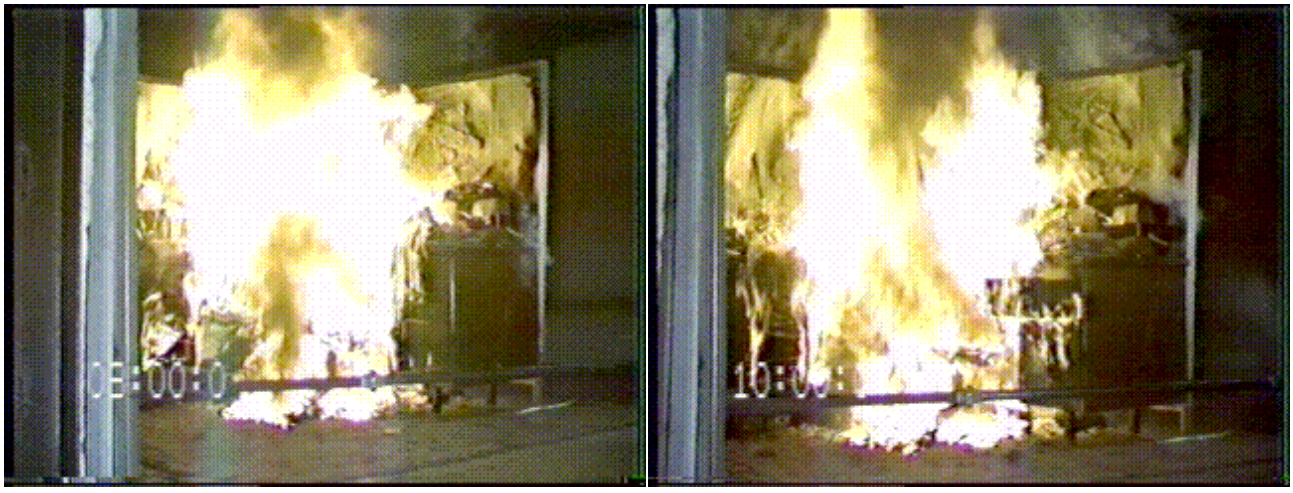

**Figure 46: Two Panel Workstation fire at time 8:00 and 10:00 minutes**

**Figure 47: Two Panel Workstation fire at time 20:00 and 30:00 minutes**

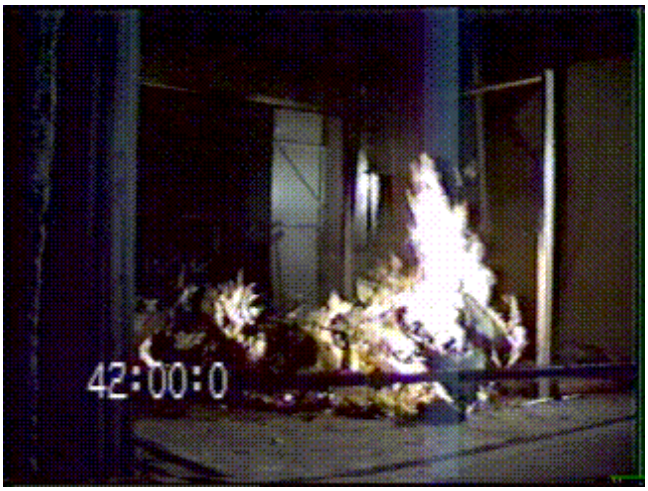


**Figure 48: Two Panel Workstation fire at time 42:00 minutes**

***PUBLISHED HEAT RELEASE RATES (UNITED STATES RESEARCH)***

Heat Release Rate (HRR) is the best and primary measure of fire hazard. Heat release rates can be affected by numerous factors, including:

1. Size and configuration of fuel package
2. Location of fuel package with respect to walls, other fuel packages, vents, etc.
3. Ignition source and location of ignition
4. Room size, construction material, vents, fire protection systems, etc.

**Table 6: Approximate "Typical" Examples of Peak Heat Release Rates**

| MATERIALS | HEAT RELEASE RATE (KW) |
|---|---|
| ***Kiosks and Displays*** | |
| Display Kiosks (Kiosk structure only) | 1,400 - 2,000 |
| ***Office Workstation Setup*** | |
| Computer Workstation | 1,000-1,300 |
| One Unit Workstation | 1,200 – 3,000 |
| Two-Panel Workstation | 2,000 |
| ***Garbage and Refuse*** | |
| Medium Wastebasket with milk cartons | 105 |
| Large barrel with milk cartons | 148 |
| Trash Bag, One Sack, 1.17 kg | 140 |
| Trash Bag, Two Sacks, 2.34 kg | 290 |
| Trash Bag, Three Sacks, 3.51 kg | 345 |
| Trash Bag, One Sack, 4.1 kg | 345 |
| 30 Gallon HDPE Garbage Can with Construction Debris | 160 - 450 |
| 96 Gallon Polyethylene Garbage (empty, no contents) | 1,000 - 2,400 |

| Materials | Heat Release Rate (kW) |
|---|---|
| ***Stackable Chairs*** | |
| Chair Mockup | 63-66 |
| Chairs (<10, metal frame) | 80-2,480 |
| Single Metal Frame, upholstered stacking chair | 90 |
| Single Stackable Chair, Polypropylene with Steel Frame, no Padding | 150 |
| Metal Frame, upholstered stacking chair 4 chairs in 1 stack | 240 |
| Two Swivel Office Chairs | 275 |
| Upholstered chair with polyurethane foam | 353 |
| Two Metal Frame Chair | 475 |
| Metal Frame, upholstered stacking chair 8 chairs in 1 stack | 500 |
| 5 Stackable Chairs in 1 row, Polypropylene with Steel Frame, no Padding | 750 |
| Metal Frame, upholstered stacking chair 8 chairs in 1 stack in the corner | 900 |
| 8 Stackable Chairs in 4 rows, Polypropylene with Steel Frame, no Padding | 1,250 |
| 6 Stackable Chairs in 1 stack, Polypropylene with Steel Frame, no Padding | 1,900 |
| 12 Stackable Chairs in 2 stacks, Polypropylene with Steel Frame, no Padding | 2,200 |
| ***Furnished Room (Dwelling Unit)*** | |
| Wastepaper Basket (no contents) | 4-18 |
| TV set | 120-290 |
| Curtains, Acrylic/Cotton | 130-150 |
| Arm Chair | 160 |
| Curtain, Velvet, Cotton | 160-240 |
| Sofa | 3,120 |
| Small Air Conditioner with a Plastic Housing | 300 |
| Wooden Desk | 640 |
| Loveseats | 940-2,980 (370, metal frame) |
| Latex foam mattress (heat at room door) | 1265 |
| Wooden Dresser | 1,800 |
| ***Typical House Hold Furnishings*** | |
| Palm, Slim Plastic House Plant | 50 |
| Ficus, Plastic House Plant | 10 |
| Manzanita Bush 1.11 kg, 87% Moisture Content | 135 |
| Ceanothus Bush 2.07 kg, 31% Moisture Content | 95 |
| Palm, Bushy Plastic House Plant | 180 |
| Rockrose Bush 2.03 kg, 14% Moisture Content | 265 |
| Christmas Tree, Dry | 500-650 |
| PVC Christmas Tree (peak was much greater, due to fast rise time) | 600 - 978 |
| Juniper Bush 2.07 kg, 31% Moisture Content | 810 |

## APPENDIX B – ATRIUM ZONE BOUNDARY

Appropriately zoned sprinkler water flow switches (sprinklers zoned within the Atrium Zone Boundary), or appropriately zoned partial coverage spot-type smoke detection and beam detection are required to activate the smoke control system. The intent of creating an Atrium Zone is to activate the smoke control system when a fire originates within the Atrium, or when the smoke from an adjacent space is spilling into the Atrium and activates a device within the Atrium. The smoke control system should not be activated upon the activation of a sprinkler/waterflow or smoke detection device outside of the Atrium Zone. This would cause smoke to migrate into the Atrium, creating a greater hazard.

To help facilitate the appropriate zoning of sprinkler/waterflow, and smoke detection devices please refer to the Figure 49 through Figure 51 below. All sprinkler/waterflow and smoke detection devices within the BLUE highlighted area are within the Atrium Zone and should activate the smoke control system. All sprinkler/waterflow and smoke detection devices outside the highlighted area should not activate the smoke control system.

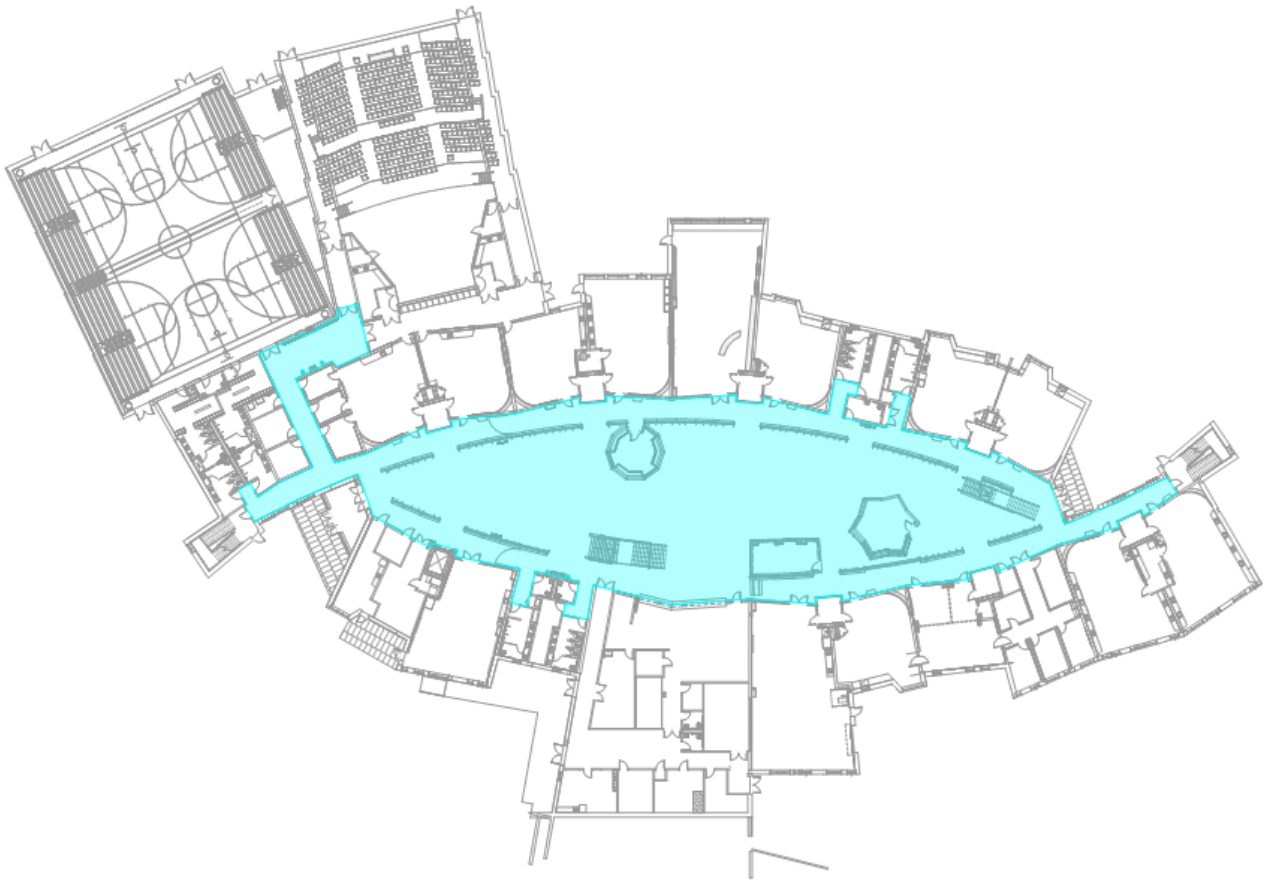

**Figure 49: Floor 1 – Atrium Boundary Zone**

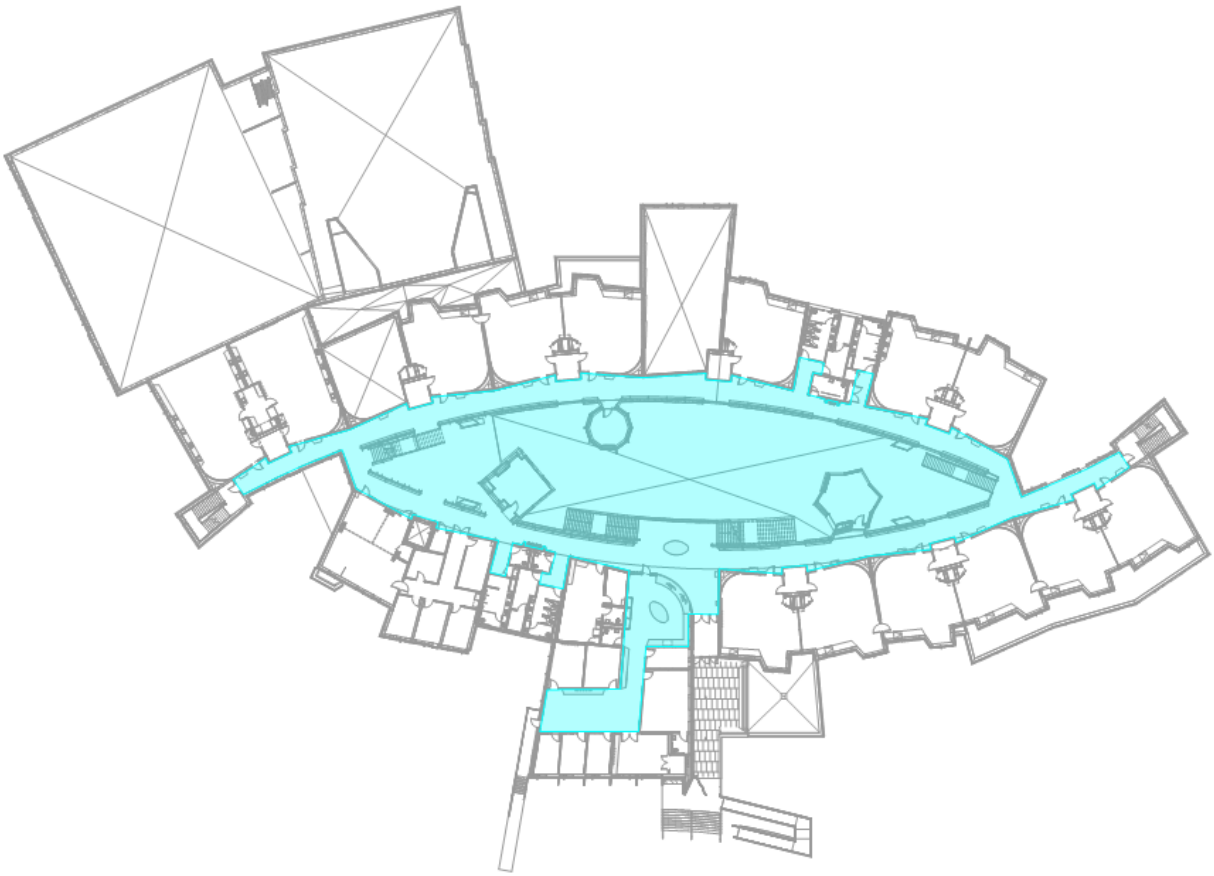

**Figure 50: Floor 2 – Atrium Boundary Zone**

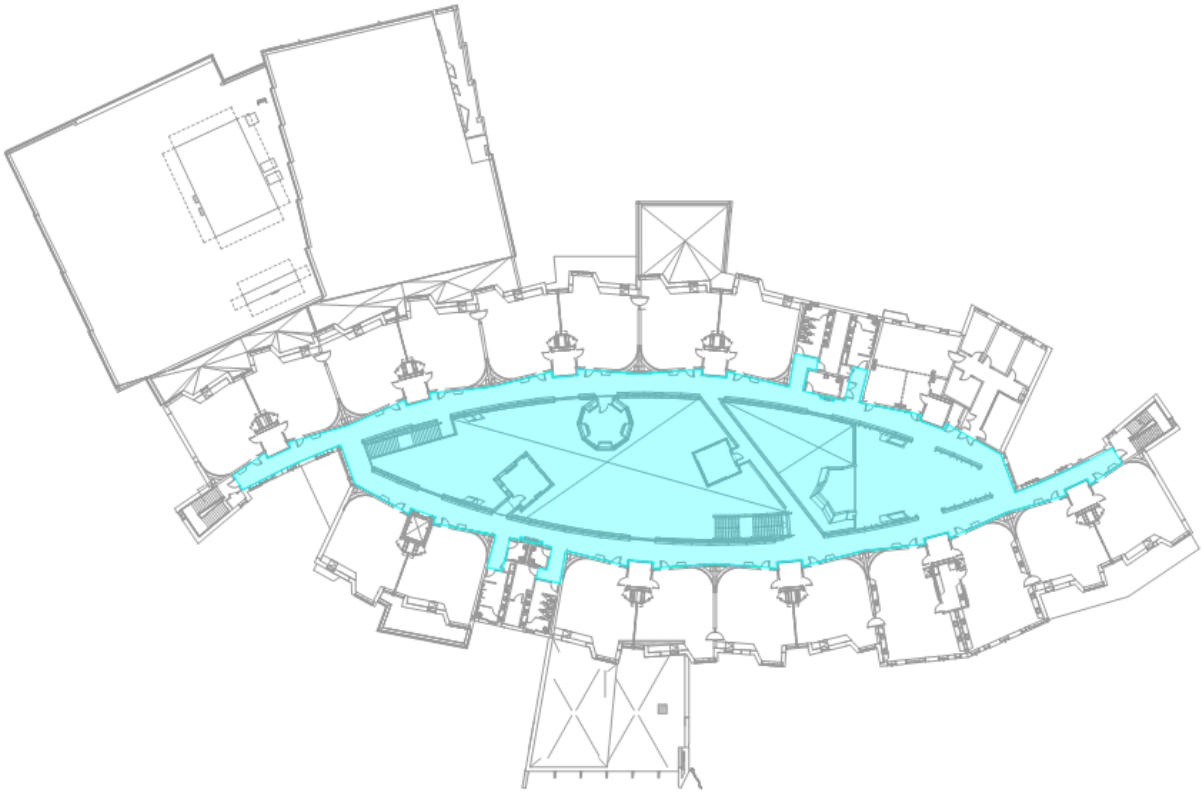

**Figure 51: Floor 3 – Atrium Boundary Zone**

## APPENDIX C – TIMED EGRESS ANALYSIS

An occupant movement and egress analysis utilizing the SFPE numerical calculation was performed for Floor 1 through Floor 3. The Life Safety Drawings created by Howe Engineers dated October 18, 2019 were utilized in order to perform the egress analysis (determine occupant loads and distribution to exits). Any changes to the Life Safety Drawings may impact the results of this analysis, thus requiring this analysis to be reevaluated. There are many components that contribute to calculating the available safe egress time (RSET). As shown in Figure 52 from the Society of Fire Protection Engineering, the calculated RSET is broken down into three (3) distinctive phases: Detection Time Phase (this phase includes detection time and alarm transmission time), Pre-movement/Delay Time to Start Phase (this phase includes recognition, and response time), and the Movement Time Phase. These components are described in more detail within the corresponding sections below.

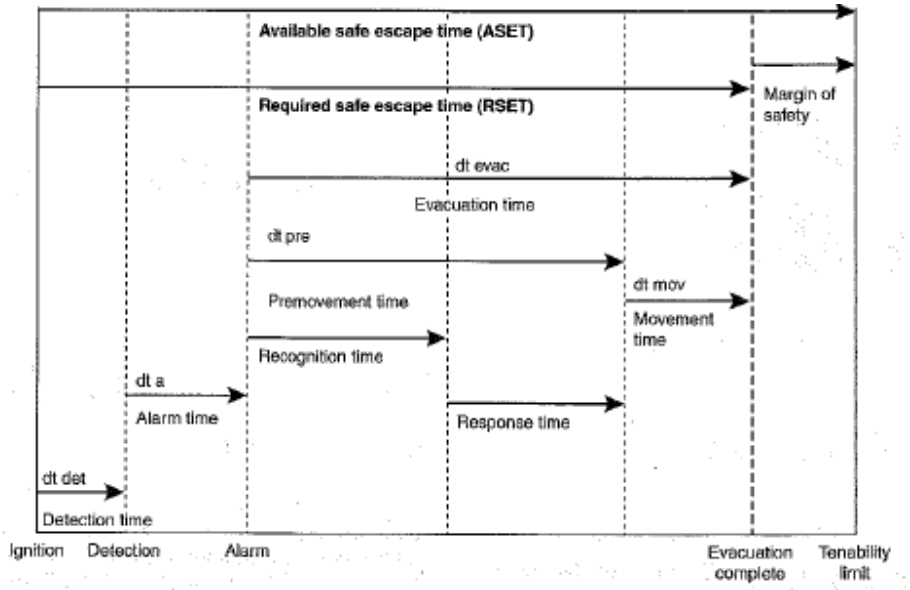


**Figure 52: Egress Time Model**

### *DETECTION TIME PHASE*

The interval between fire ignition and the first detection of the fire by a device or an individual. For this analysis, the means of fire detection is via smoke detection, or sprinkler activation and waterflow switch. Note, the building will be provided with smoke detection throughout.

1. Detection Time: Smoke detection is modeled within the building. The longest time to detection of a smoke detector in any of the scenarios presented in this report is approximately 103 seconds, therefore, to remain conservative a detection time of **103 seconds** was used for this analysis.
2. Alarm Time: The interval between detection of the fire and the time at which an alarm signal is activated or notification of occupants takes place. In most cases the alarm time occurs effectively simultaneously with the detection time and therefore no additional time is required to be added for alarm time. However, for conservatism, a **10 second** delay is included within this analysis, which is the maximum transmission time of an alarm signal allowed by NFPA 72.

## *PRE-MOVEMENT TIME PHASE*

The interval between the time at which the alarm signal is given and the time at which the decision is made and the person starts evacuation. This consists of two (2) components:

1. Recognition Time: The interval between the time at which the alarm signal is perceived and the time at which the occupant interprets this signal as indicating a fire/emergency event. This time includes investigation and milling.
2. Response Time: The interval between recognition time and the time at which the first move is made to evacuate the building. This time includes activities such as firefighting, warning others, gathering family members and pets, dressing, retrieving personal belongings, calling the fire department, etc.

Table 7 below is provided to approximate the Alarm Time, Recognition Time and Response Time for given occupancies based on the type of warning system, the type of occupancy, and the characteristics of the occupants. The Framingham Fuller project, which is classified as primarily a Group E educational occupancy, will be provided with an emergency alarm/voice communication fire alarm system. Conservatively, a "W2" delay for buildings, which denotes occupants that are awake but not familiar with the building, shall be used for analyzing occupant movement, and an applicable occupant pre-movement time after alarm of **3 minutes (180 seconds)** will be used.

**Table 7: Estimated Delay Time to Start Evacuation**

| Occupancy Type | W1 (min) | W2 (min) | W3 (min) |
|---|---|---|---|
| Offices, commercial and Industrial buildings, schools, colleges and universities (Occupants awake and familiar with the building, the alarm system, and evacuation procedure.) | < 1 | 3 | > 4 |
| Shops, museums, leisure-sport centers, and other assembly buildings (Occupants awake but may be unfamiliar with building, alarm system, and evacuation procedure.) | < 2 | 3 | > 6 |
| Dormitories, residential mid-rise and high-rise (Occupants may be asleep but are predominantly familiar with the building, alarm system, and evacuation procedure.) | < 2 | 4 | > 5 |
| Hotels and boarding houses (Occupants may be asleep and unfamiliar with the building, alarm system, and evacuation procedure.) | < 2 | 4 | > 6 |
| Hospitals, nursing homes, and other institutional establishment (A significant number of occupants may require assistance.) | < 3 | 5 | > 8 |

W1: live directives using a voice communication system from a control room with closed-circuit television facility, or live directives in conjunction with well-trained, uniformed staff that can be seen and heard by all occupants in the space
W2: nondirective voice messages (prerecorded) and/or informative warning visual display with trained staff
W3: warning system using fire alarm signal and staff with no relevant training

## *MOVEMENT TIME PHASE ANALYSIS*

The interval between when occupants begin to move toward an exit and when all occupants reach a place of safety. In order to evaluate the performance of the egress components, and to compare it to the results of the CFD modeling, the SFPE Hand Calculations for egress time have been performed for Floor 3, which is the limiting required egress time. The smoke would reach Floor 3, and therefore if all occupants are egressed from Floor 3 prior to smoke reaching them it is assumed that the other levels would also be provided with enough time for the associated occupants to egress appropriately. Please note that the smoke control rational analysis demonstrates that the smoke layer is maintained above Floor 3 for the duration of the scenarios.

**Timed Egress Calculations**

The timed egress calculation analyzes expected evacuation times from the building under moderate movement conditions, which is expected. A moderate movement scenario may include the evacuation of the floor when everyone leaves the facility, and assumes no blocked exits.

The total time for evacuation can be considered the time required to travel from the most remote point in the building to the rated stair enclosure plus the flow time required for each occupant to pass through the most restrictive egress component (this approach is identified in the SFPE Handbook).

**Moderate Movement Conditions**

This scenario considers the evacuation of Floor 3 (highest level within the Framingham Fuller Middle School Atrium) when everyone begins to exit the building. The following assumptions were made in calculating the evacuation times:

- Every means of egress from the floor is available for use and not considered blocked.
- The total occupant load of the floor is 636 people, as indicated by Life Safety Plan LS103.
- Occupant distribution to the varying exits varies as indicated by Life Safety Plan LS103.

The following evacuation time calculations are based on adding the time it takes for a person to travel the most remote distance to the time it takes everyone to pass through the most restrictive egress component. For occupant load distribution please reference the Life Safety Drawings.

**Flow Time**

The flow is the measurement of the flow of evacuating persons past a point in the exit route per unit of time per unit of effective width. The specific flow is calculated by applying Equation (59.6) from the 5th Edition of the SFPE Handbook, Chapter 59, entitled, “Employing the Hydraulic Model in Assessing Emergency Movement” by Steven M.V. Gwynne and Eric R. Rosenbaum. The specific flow is calculated as follows:

$$F_s = SD$$

Where:
$F_s$ = specific flow in persons/minute/ft of effective width
S = speed in persons/minute
D = density in persons/$ft^2$

Table 8 shows the specific flows for various aspects of the egress system at moderate densities.

**Table 8: Specific Flow for Moderate and Crush Densities**

| Egress System Component | **Speed (persons/minute)** | **Density (persons/ft$^2$)** | **Specific Flow (persons/minute/ft)** |
|---|---|---|---|
| Doorways | 196.35 | 0.1 | **19.64** |
| Stairs with 7 inch riser and 11 inch tread | 151.37 | 0.1 | **15.12** |

The calculated flow for a given point is determined by applying Equation (59.8) from the 5th Edition of the SFPE Handbook, Chapter 59, entitled, "Employing the Hydraulic Model in Assessing Emergency Movement" by Steven M.V. Gwynne and Eric R. Rosenbaum. Calculated flow is determined by multiplying the specific flow by the effective width of the given point (ie: doorway, stair, ramp, etc.).

$$F_c = F_s W_e$$

Where:
$F_c$ = calculated flow in persons/minute
$F_s$ = specific flow in persons/minute/ft = 19.64 persons/min/ft for doors
$W_e$ = effective width in feet = Door width – 6" boundary from each side

The estimated flow (minutes) can then be determined by dividing the number of persons exiting (provided on the Life Safety Drawings) by the Calculated Flow ($F_c$). A summary for each of the exits on Floor 3 is provided below:

| FLOW TIME RESULTS[1] | | | | | |
|---|---|---|---|---|---|
| Flow Point | Limiting Component | Width | Number of Persons Exiting | Calculated Flow [$F_C$] (persons/min) | Estimated Flow Time (minutes) |
| **Stair 1** | Door | 2'10" | 213 | 36.00 | **5.91** |
| **Stair 2** | Door | 2'10" | 101 | 36.00 | **2.80** |
| **Stair 3** | Stair | 4'7" | 121 | 54.18 | **2.23** |
| **Stair 5** | Stair | 8'4" | 201 | 110.88 | **1.81** |

Notes:
**1.** Please Reference Life Safety drawings for occupant load distribution information

As shown in the table above, since the occupant load distribution varies, Stair 1 has a larger number of occupants using the stair. Therefore, the flow time at Stair 1 is significantly longer. The flow time for Stair 1 of **5.91 minutes** will be used in calculating the total evacuation time. This assumes no aid in the evacuation process from operations personnel to produce a conservative approach.

**Travel Time**

The speed along the line of travel can be determined by applying Equation (59.5) and Table 59.2 from the 5th Edition of the SFPE Handbook, Chapter 59, entitled, "Emergency Movement" by Harold Nelson and Hamish MacLennan. The speed of movement along a level line of travel is calculated as follows:

$$S = k - akD$$

Where:
S = speed
D = density; (Moderate Density = .1 persons/ft$^2$)
k = constant, from Table 3-14.2, seen below.
a = 2.86 for speed in ft/minute and a density in persons/ft$^2$

Table 9 shows the speed of movement along a line of travel for various aspects of the egress system.

**Table 9: Speed of Movement for Moderate and Crush Densities**

| Egress System Component | **k = constant from Table 3-14.2** | **D = Density (persons/ft$^2$)** | **Speed (ft/minute)** |
|---|---|---|---|
| Level Surfaces & Doorways | 275 | 0.1 | **196.35** |
| Stairs with 7 inch riser and 11 inch tread | 212 | 0.1 | **151.37** |

The travel time is calculated from the most remote point to the egress component which yields the longest flow time. In this case, travel time is calculated for the maximum travel distance to each of the stair exits as shown on the Life Safety Drawing. The travel time is calculated as follows:

| TRAVEL TIME RESULTS | | | |
|---|---|---|---|
| Travel Points | Estimated Distance on Level Surface (ft) | Speed on Level Surface (ft/min)[1] | Estimated Travel Time (minutes) |
| **Stair 2** | 237'0" | 196.35 | **1.21** |
| | | **Maximum Travel Time (min) =** | **1.21** |

Notes:
1. Speed of occupants is based on travel over a relatively flat surface and equation S= k - akD (SFPE Handbook); where k= 275 for ramps; a=2.86 (constant); and D=0.1 for moderate density

As shown in the table above, the total travel time that can be expected from the most remote area to the stair of the building is **1.21 minutes**. Therefore, the TOTAL evacuation time expected for every occupant on Floor 3 to reach an exit enclosure **7.12 minutes** (5.91 min + 1.21 min= 7.12 min).

## *CONCLUSIONS*

The Required Safe Egress Time (RSET) is based on the time at which the last occupant in the timed egress analysis leaves the interior portions of Floor 3 via an exit enclosure (i.e. exit stairway or exit passageway). The total RSET for the building is based on the maximum time for an occupant, within the atrium, to reach an exit. A 50-percent margin of safety is applied to calculate the movement time that was used to determine the Required Safe Egress Time (RSET), as required by MSBC Section 909.4.6.

The atrium spaces are large volume spaces and there is active smoke control to prevent large exits from being blocked by fire locations, the analysis is not required to address blocking of exits.

Given the information presented above, we would expect the following total Required Safe Escape Time (RSET):

| **Fire Alarm Detection Time** | **+** | **Pre-Movement Time** | **+** | **Movement Time** (+ 50% Safety Factor) | **=** | **Required Safe Escape Time** |
|---|---|---|---|---|---|---|
| *1 min 53 seconds* | + | *3 mins 00 seconds* | + | *10 mins 41 seconds* | | *= 15 mins 34 seconds* |

**Based on the Smoke Control Rational Analysis Report, the smoke control system is capable of maintaining Available Safe Egress Time (ASET) in excess of 25 minutes. Since the ASET is greater than the RSET of 15 minutes 34 seconds, it can be determined occupants will be able to evacuate the building while tenable conditions are maintained along the egress paths in the atrium of the building. Additionally, it is important to note, the results within smoke control rational analysis demonstrate the smoke control system reaches steady state smoke level conditions within the 25-minute model duration. Therefore, it is expected that tenable conditions will be maintained indefinitely, provided the smoke control system is operational.**

### 3.1.4 Proprietary Items

The SBC voted to approve the attached proprietary specification at their 9/16/19 meeting and requested the School Committee to approve at an upcoming meeting.

Also attached is the listing of Proprietary Specifications, dated May 22, 2019, recommended to be included in the Fuller Middle School project. The proprietary items were approved by the following elected bodies of the District:

School Building Committee on Monday, June 3. 2019
School Committee on Wednesday, June 5, 2019

Approval documentation is included in the certified attached School Committee Meeting Minutes from June 5, 2019.

SMMA

Project Management

# Memorandum

| | | | |
|---|---|---|---|
| To: | Fuller Middle School Building Committee | Date: | 9/16/2019 |
| From: | Joel G. Seeley | Project No.: | 17050 |
| Project: | New Fuller Middle School | | |
| Re: | Proprietary Specification | | |
| Distribution: | School Building Committee (MF) | | |

School Building Committee Members,

Please find the supplemental listing of Proprietary Specifications, dated September 9, 2019, recommended to be included in the project by Framingham Public Schools Building and Grounds Department. These have been reviewed by the architect and they agree with the recommendation. This is a supplement to the list approved by the School Building Committee at the June 3, 2019 School Building Committee meeting.

The School Building Committee is requested to approve the attached recommended listing of Proprietary Specifications and recommend approval by the School Committee.

1000 Massachusetts Avenue
Cambridge, MA 02138
617.547.5400

www.smma.com

**MEMORANDUM**
DATE: September 9, 2019

**PROJECT: Fuller Middle School Framingham, MA**
**SUBJECT: Proprietary Items**

TO: Joel Seeley, SMMA
FROM: Philip Gray, AIA Jonathan Levi Architects

On July 29, 2019 the architects reviewed the use of 2 ballistic glazing products for use in the new Fuller Middle School with the Framingham Public Schools Director of Safety and Security, the FPS Building and Grounds Department, and the School principal. These products were unanimously recommended to be listed as proprietary in the specifications for the new Fuller School. These will need to be voted on and approved by the SBC in order to be included in the specification for the new Fuller Middle School.

| SYSTEM | MANUFACTURER | REASON FOR RECOMMENDATION |
|---|---|---|
| School Guard Glass, product SG4 | LTI Smart Glass, Inc. 14 Federico Drive, Pittsfield, MA 01201 | Where proposed in building, provides greatest degree of protection in combination with standard framing systems |
| 3M Scotchshield S Series Safety and Security Window Film | 3M commercial Solutions, 3M Center, Bldg. 220-12-E-04; St. Paul, MN 55144-1000 | Where proposed in building, provides greatest degree of protection in combination with standard framing systems |

- Provide a list identifying all proposed proprietary items (if any)with an affidavit which shall indicate an elected body of the district (school committee, city or town council, or selectmen, - but not an ad-hoc building committee) has been presented with proposals for proprietary requirements approval action, has had an opportunity to investigate, or to require staff or consultant investigation upon each item so proposed, and has majority voted in an open public session that is in the public interest to do so. Provide MSBA with a certified copy of the vote of the elected body.
- An interior color theory statement describing proposed paint and material selections and colors for typical and special spaces, why they have been selected and how these selections relate to exterior materials and colors. Confirm that color and material selections have been presented to and approved by the District
- Confirmation of project registration with CHPS or USGBC
- Structural narrative including methods of lateral bracing and how requirements of earthquake code will be met
- Structural calculations and required floor loads
- Energy calculations
- Life Cycle cost analysis for energy and water consuming devices
- Heat gain and loss calculations for Heating, Ventilating and Air Conditioning systems
- Calculations showing total electrical load
- Security and visual access requirements:
    - Confirmation that the persons responsible for implementation of the District's emergency procedures, and responding emergency medical, fire protection, and police agency representatives have been consulted in the planning process and any associated requirements have been included in the project
    - Identification of any other security related items particular to the District and/or the proposed project
    - Verification that the following safety and security related issues have been reviewed and are in accordance with the District's procedures as noted above:
        - Main entrance design – describe District protocol for visitor entry and check-in related to the current design for visitors to remain in the vestibule versus a side sub-vestibule
        - Classroom lockset hardware - confirm hardware functions are compatible with the District's protocols related to lockdown
        - Classroom / Instructional spaces visibility - confirm that the inclusion of sidelights at entrance locations is compatible with the District's current standards related to visibility from corridors and whether any related vision control option measures are to be incorporated
        - Alternative entry locations - confirm project includes site and building signage, as may be required by District's emergency procedures, to identify locations where first responders may more directly reach a person needing medical attention; Knox

SMMA

Project Management

# Memorandum

| | | | |
|---|---|---|---|
| To: | Fuller Middle School Building Committee | Date: | 6/3/2019 |
| From: | Joel G. Seeley | Project No.: | 17050 |
| Project: | New Fuller Middle School | | |
| Re: | Proprietary Specification | | |
| Distribution: | School Building Committee (MF) | | |

School Building Committee Members,

Please find the updated listing of Proprietary Specifications, dated May 22, 2019, recommended to be included in the project by Framingham Public Schools Building and Grounds Department. These have been reviewed by the architect and the engineers and they agree with the recommendation. This is an update of the list reviewed at the April 8, 2019 School Building Committee Meeting.

Also attached is an excerpt from the MSBA's Detailed Design Requirements Module 6, which requires a vote by an elected body of the District for proprietary specifications.

The School Building Committee is requested to approve the attached recommended listing of Proprietary Specifications and recommend approval by the School Committee.

1000 Massachusetts Avenue
Cambridge, MA 02138
617.547.5400

www.smma.com

**MEMORANDUM**

DATE: March 15, 2019, *Revised March 21, 2019, Revised April 8, 2019, Revised May 22, 2019*

**PROJECT: Fuller Middle School Framingham, MA**
**SUBJECT: Proprietary Items**

TO: Joel Seeley, SMMA
FROM: Elizabeth Bugbee, AIA Jonathan Levi Architects

On February 20, 2019 the Framingham Public Schools Building and Grounds Department identified and recommended the following items to be listed as proprietary in the specifications for the new Fuller School. These items were reviewed with the architect and MEP engineers, who agree with the recommendations. These will need to be voted on and approved by the SBC in order to be included in the specification for the new Fuller Middle School.

| SYSTEM | MANUFACTURER | REASON FOR RECOMMENDATION |
|---|---|---|
| Automatic Temperature Controls | Tridium Niagra N4 Supervisor - JACE Controller | Tridium Niagara N4/Supervisor is the current City standard for the Building Management System (BMS). This would be an extension of the City's existing building management Architecture system with Tridium Niagara N4/JACE controllers and will provide a seamless tie-in to the existing City's building management system BMS Server.<br>The Tridium Niagara N4/Jace would therefore result in the reduction of costs of maintenance staff training and servicing, to improve reliability of service from contractors, and improve integration of systems into the existing Facility control network.<br>The Tridium Niagara N4 Supervisor system provides an open platform to allow integration of a variety of other control system protocols with JACE Controller (eg BACNet IP, etc.) |
| Network Switches | HP | Maintaining a standard set of manufacturers for this type of equipment helps to lower the total cost of ownership of the system by allowing the City to maintain a standard operating procedure for installation, operation, support and maintenance. |
| Access Control | S2 | Maintaining a standard set of manufacturers for this type of equipment helps to lower the total cost of ownership of the system by allowing the City to maintain a standard operating procedure for installation, operation, support and maintenance. |
| Closed Circuit TV | Cisco Meraki System | Maintaining a standard set of manufacturers for this type of equipment helps to lower the total cost of ownership of the system by allowing the City to maintain a standard operating procedure for installation, operation, support and maintenance. |
| Door Hardware Key System and Lock Cylinders | Schlage Classic Keyways: C, E, EF and F. | The existing Framingham Public Schools master key system is a registered system with Schlage Lock. The school district would like Fuller Middle School keyed into the existing registered master key system. |
| Classroom Door Hardware | Securitech QID | Allows user to quickly lock classroom door via push button in lieu of thumb turn or key and has visual indicator to notify occupants that the door is deadbolted and the outside lever is locked. |

- Provide a list identifying all proposed proprietary items (if any)with an affidavit which shall indicate an elected body of the district (school committee, city or town council, or selectmen, - but not an ad-hoc building committee) has been presented with proposals for proprietary requirements approval action, has had an opportunity to investigate, or to require staff or consultant investigation upon each item so proposed, and has majority voted in an open public session that is in the public interest to do so. Provide MSBA with a certified copy of the vote of the elected body.
- An interior color theory statement describing proposed paint and material selections and colors for typical and special spaces, why they have been selected and how these selections relate to exterior materials and colors. Confirm that color and material selections have been presented to and approved by the District
- Confirmation of project registration with CHPS or USGBC
- Structural narrative including methods of lateral bracing and how requirements of earthquake code will be met
- Structural calculations and required floor loads
- Energy calculations
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- Heat gain and loss calculations for Heating, Ventilating and Air Conditioning systems
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- Security and visual access requirements:
    - Confirmation that the persons responsible for implementation of the District's emergency procedures, and responding emergency medical, fire protection, and police agency representatives have been consulted in the planning process and any associated requirements have been included in the project
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    - Verification that the following safety and security related issues have been reviewed and are in accordance with the District's procedures as noted above:
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        - Alternative entry locations - confirm project includes site and building signage, as may be required by District's emergency procedures, to identify locations where first responders may more directly reach a person needing medical attention; Knox

# Framingham Public Schools

**Robert A. Tremblay, Ed.D., Superintendent of Schools**

**SCHOOL COMMITTEE**

Adam Freudberg, Chair • Gloria Pascual, Vice Chair • Tracey Bryant, Clerk
Noval Alexander • Geoffrey Epstein • Richard A. Finlay
Beverly Hugo • Tiffanie Maskell • Scott Wadland
Yvonne M. Spicer, Mayor
73 Mount Wayte Avenue, Second Floor, Framingham, MA 01702
Telephone: 508-626-9121 Fax: 508-877-4240


## SCHOOL COMMITTEE: OPEN MEETING MINUTES

| | |
|---|---|
| **DATE AND TIME:** | June 5, 2019 at 7:00 p.m. |
| **LOCATION:** | Memorial Building-Blumer Room<br>150 Concord Street, Framingham |
| **MEETING CALLED BY:** | Chair Adam Freudberg |
| **PRESENT:** | Noval Alexander<br>Tracey Bryant<br>Geoffrey Epstein<br>Richard A. Finlay<br>Adam Freudberg<br>Beverly Hugo<br>Tiffanie Maskell*<br>Gloria Pascual*<br>Mayor Yvonne Spicer* |
| **ABSENT:** | Scott Wadland |
| **ALSO PRESENT:** | Nicholas Small, Chair of Student Advisory Committee<br>Dr. Tremblay, Superintendent<br>Lincoln Lynch, Director of Finance and Operations<br>Rose Bailey, Student Advisory Committee<br>Matt Torti, Director of Building and Grounds |

The Chair called the meeting to order at 7:01 p.m.

Call to Order

The Chair announced that this meeting was being broadcast live on local cable, as well as for later playback, and on Facebook Live.

Public Comment

Ron Chick said he is a representative for the Sue Haskell Watershed for Framingham, and he brought Riverfest brochures. He said that there are many events coming up, including a water cleanup on June 22nd at 151 Central Street starting at 8:00 a.m., and a senior tour of the river at 11:00 a.m. He said he is looking for volunteers, especially student volunteers, for various clean ups in the area, and would like to work with the Ecology Club at the High School. He said he is working on a project on invasive vegetation on the Cochituate Rail Trail in Saxonville, and eliminating invasive water chestnuts on the Sudbury River. He suggested that students could possibly get credits for volunteering. He said he is also the Chair of the Friends of Saxonville and welcomes participation. The Chair asked the Superintendent to have someone from his team follow up on the ideas regarding student participation.

Noval Alexander said he wanted to make a brief comment on commemorating D-Day tomorrow and asked for a moment of silence. He said that on this day 75 years ago, hundreds of thousands of young soldiers, sailors, marines and airmen were staging in southern England to commence Operation Overlord, otherwise known as D-Day, where they crossed the English Channel to liberate Europe from Nazi Germany. He said that no matter what race, religion or natural origin, all had the common purpose to defeat the tyrannical German dictator Adolf Hitler. He said that day, over 10,000 allied soldiers died on the beach in Northern France, and he would like to take a moment of silence and remember that.

Richard Finlay said he wanted to send get well wishes to Mr. Wadland who is home recovering.

Announcements from the Chair

No announcements from the Chair.

Student Advisory Committee Presentation on Intramural Sports and School Spirit

Student Advisory Committee members Nicholas Small and Rose Bailey presented a report based on a survey sent to students regarding interest in intramural sports and thoughts on school spirit. They said that they found from these surveys that a large number of students are interested in intramurals, and school spirit at FHS is good but could be improved - with ideas such as adding more pep rallies, themed events and improved faculty support at student events.

**Questions**. Mr. Epstein asked what the next steps are in regards to starting intramurals. Mr. Small said they had a brief discussion with Mr. Spear, the Athletic Director, and he said that the biggest issue would be space, but an intramural like Dance would be more do-able because there are specific classrooms that could accommodate Dance. Mr. Epstein said that there are a lot of high intensity sports that take over all the facilities and a lot of money spent on those: Maybe they could skip those sports one day a week or use the facilities when they have games out of town. He said there is a need to look at how to service intramurals, rather than just say it is an interesting idea that we cannot do.

Action Civics Commission Presentation on Homework Policy

Dr. Tremblay said starting the Action Civics Commission was one of his goals, and it will provide grades 9-12 with a representation of government. Action Civics Commission members Mira

Donaldson, Hailey Vanaelstyn, Laura Scaria, Anne Culhane-Williams, Sanga Esther Kalemba, Ava Caiola, and Harold Pacheco Diaz presented their proposed homework policy, which they developed after they had reviewed other policies from other schools, and news articles, as well as taking information from interviewing students and teachers. Ava Caiola said that along with the proposal of no homework for those who are in MCAS testing, they also want to add the ACCESS testing for ELL and ESL students, but that was not included in this draft. She said that they also met with the faculty to present their draft, get feedback, and answer questions on their proposed policy. Mira Donaldson added that edits from that meeting were able to be added to the policy.

Mr. Freudberg said that last year this policy was voted on to refer to the Policy Subcommittee, so now they have some insight to determine next steps.

**Questions**. Mr. Finlay spoke about the stress on students for homework and having to balance it with extracurricular activities and sports. Ms. Bryant asked which neighboring schools' policies were looked at, as well as how they decided that homework on weekends should not exceed that of a weekday. She added that sometimes students who have extracurricular activities during the week, use the weekend to catch up on schoolwork. Mira Donaldson said they looked at policies from Hopkinton, Holliston and Natick. Ava Caiola said that the biggest issue seems to be that whenever there is time to relax, teachers have tried to fit an extra assignment in to fill the time, and students have felt a bit of an overload. She said that they felt that students should still have homework on the weekend, but with a limit; this will allow students to still be able to do activities they want to do, while still staying involved with school. She added that this is the same with school vacations - for students to keep on track and be thinking of school work, but also be able to enjoy time away from school. Ms. Pascual suggested the possibility of forms being used for the observance of religious holidays, to be able to make it clearer to teachers to put this consideration into action, for equity, and forms could possibly be used for other things going on in life besides just holidays. She also suggested that teacher communication to students be improved - such as the family and guidance counselor being contacted after two missing assignments, so everyone is aware before students get too far behind, and are not able to recover. Ava Caiola said that teacher feedback suggested the possibility of students being referred for after-school help with peer tutoring after a few missed assignments. Ms. Pascual said there is a need to look at holding teachers accountable for putting this into place, and making sure there is a measurement, as well as to allow teachers, counselors, and parents to know when there is a need to help students and get them that help. Ms. Maskell asked what the expectation for the amount of homework per night is currently, and suggested that there be a defined amount of time for homework; since students work at different levels and if they can't master it by a certain point, should they really be spending hours on it. Mira Donaldson said that the current policy has a three hour minimum and no maximum. Anna Culhane-Williams said that when they talked to the teachers this came up, and they discussed how the amount of time each student spends on homework depends on each individual student, and defining a specific time would be a bigger discussion. Ava Caiola said they also discussed possibly defining it per department, but this again would be a larger conversation, and would take more time to get into and implement.

*Mayor Spicer arrived at 7:40 p.m.

Ms. Maskell said that the proposed policy notes that homework is lessened for all classes, except for AP classes. Laura Scaria said AP classes have a set curriculum to get through for the year in order to take the AP test, so it is hard to limit the homework. Ms. Maskell said she's

sure some kids would abuse it if there was a set amount of time defined, but the majority of students seem to be working hard at whatever level they are at. Hailey Vanaelstyn said that AP tests happen earlier than the end of the year testing, so that time is made up in the school breaks, which is why a break is not listed during vacation week for AP classes. Ms. Hugo asked if the students researched the types of homework that seemed to be most beneficial vs. homework that just seemed like busy work; and if they had researched flipped classrooms where students listen to the lesson at home and do a project or discussion in class. Esther Kalemba said she had talked to a teacher about flipped classrooms, and it seems like it wouldn't work for all teachers. She added that it seems like it would mostly work for math classes, but for english and history it would be harder for students to do at home, and harder for teachers to create a lecture. Anne Culhane-Williams said flipped classrooms would possibly take away from in-class learning - being able to learn and ask clarifying questions, and she thinks it would vary between students if it would be beneficial or not. Hailey Vanaelstyn said a lot of students' complaints were that teachers were assigning busy work to just give homework. Ava Caiola said it was a point of contention with teachers, as teachers argue that they can think everything they assign is important and beneficial, and pushed back on how the students define what's meaningful. Mr. Epstein said part of this touches on learning style, and asked how many students contributed feedback when they were gathering it. Anna Culhane-Williams said they asked friends, along with the members of the Commission, but it was not sent out as a survey. Mr. Epstein asked if students find that teachers coordinate homework assignments, and suggested that teachers look to spread out the homework and coordinate, so not everyone is assigning a lot on a certain night. Mira Donaldson said teachers within the same department sometimes coordinate, but the classes are not always at the same place in the curriculum. Ava Caiola said if all teachers used the same program, such as Google Classroom or Canvas, they could see what other teachers assigned, but teachers all use different programs and there is no coordination; students can have multiple tests on the same day. Mr. Epstein asked if students felt that homework was graded in a timely fashion. Hailey Vanaelstyn said that it varies widely depending on the teacher, and that it seems that teachers may not be able to keep up with grading the amount of homework that they are assigning. Mr. Epstein asked that the administration look into an information management system, so teachers can see who has homework assigned etc., as well as keep track of when it is graded. Ava Caiola said within this proposed policy, they added that teachers try to give a weeklong look at homework, so students are able to plan ahead.

<u>Update on BLOCKS Capital Project</u>

Director of Building and Grounds Matt Torti gave an update on the Blocks Capital Project. He said that the library, which is now closed, was being used as breakout learning spaces for special programs and multiple functions, and these programs are now displaced. He said that in January there was a roof leak, and once opened up there was some structural damage and the insurance company would not pay for any remedial work. He said they have enlisted the services of an architect to do a preliminary design, provide cost estimates, and that the project still needs to go out to bid. He said that this is past the date of the Capital Project Request, so this has been deemed as an emergency capital budget request. He said that the Chair has sent a letter to the Mayor asking for additional funding, but they are currently paying for the architect out of the operating budget to make sure the project is started as soon as possible. He said they are presenting on this to the City Council on June 12th, and the full vote is on June

18th. Mr. Lynch said, originally they were thinking to swap out this project with the Potter Road project, but that is no longer the case. He said that they are keeping the initial request and adding this project on top of the Capital Budget Request, which increases the request from $3,295,277 to $3,785,277. Mr. Freudberg said this does not need a vote from the School Committee since it is an off-cycle appropriation, and the City Council voted last night to refer it to the City Council's Finance Subcommittee. He said it is a 2,500 square foot room that cannot be currently used. Mayor Spicer asked if there are plans to add anything besides the original footprint. Mr. Torti said the cost estimate is to just refurbish and put the area back to the former use. He said that due to it being an added modular unit, they were able to completely isolate it from the rest of the school and no-one is allowed in there, as it is currently an unsafe situation. Mayor Spicer suggested there be a complete assessment of all the buildings done in order to determine if any more of the buildings are currently in jeopardy, and going forward, to prioritize project order based on building conditions. Mr. Torti said the only other modules are at the Hemenway and Brophy Schools. He said that they do periodic inspections, annually have the City's Building Department perform inspections, and get occupancy permits. He said that this roof was different than the other modular units.
*Ms. Pascual left the meeting for a short break.

Approval of Proprietary Specification for the Fuller Building as Required by the MA School Building Authority

The Chair said that the School Building Committee voted to approve the proprietary specifications for the Fuller Building Project this past Monday night, and a step required by the Massachusetts School Building Authority is for another elected board, in this case the School Committee, to concur with the vote.

**Motion**: To affirm the vote of the School Building Committee to accept the approval of proprietary specifications for the Fuller Building Project.

**Moved:** Ms. Bryant **Seconded:** Mr. Alexander **Vote:** Unanimous (7-0-0)

(Yes: Hugo, Finlay, Freudberg, Alexander, Epstein, Maskell, Bryant. Ms. Pascual had stepped out of the meeting momentarily at the time of the vote.)

Mr. Torti said that the Design Day for the **McCarthy Playground** is tomorrow, hosted by Kaboom who gave the grant, and will involve the PTO, volunteers, parents, and children and they can help with the design. He said that TJX Sierra Trading Post is a main donator, and are providing 120 volunteers on build day. Mr. Freudberg asked about keeping the tires that are in the current playground, and asked for scheduling between the build day and construction on the Fuller Project. Mr. Torti said they will be planning in conjunction with the Fuller Project, due to parking. He said that they cannot put in new tires because of code issues; but they are going to try and leave the current tires in place. He said that most of the existing playground will be removed to make way for new equipment, and the total value is probably upwards of $120,000.

Progress Report on Superintendent's Goals

Mr. Freudberg reminded members that the Evaluation of the Superintendent is due June 11, 2019. Dr. Tremblay presented an orientation on the evaluation and went over his progress report on his goals, and said that in the Team Drive there are items of evidence, which is also embedded within his progress report. He said that last year members gave feedback on him

being more involved in the instructional practices, and he believes that he has been fully invested in that this year, including the visits to the schools every morning, meeting with senior team and principals. He asked that if members had any questions on any of the indicators, or want to see any other evidence, to let him know. He said that this upcoming year is going in to the third and last year of the current Strategic Plan, and they will be starting to work on the next Strategic Plan in August. He also spoke about the progress that has been made within the District: The dual language programming will be expanded to four elementary schools beginning next year and they already have a wait list; they created a Bilingual Parent Advisory Council; senior advisors have been going to ,events in the community to engage with families and constituents in a program they call "Be Heard Tours" - to talk to them about their needs in school; they have expanded the King School autism strand; and by moving away from ACCEPT for transportation, the District saved $800,000 in next year's budget; and many other accomplishments.

**Questions**. Mr. Finlay asked if there were any grants available to start implementing free Pre-K programs, such as they used when the District implemented free universal Kindergarten. Dr. Tremblay said part of the current research is to find out how Pre-K - K programs are being funded, as well as the availability of money and a location. He said that this can be worked on with the Strategic Initiatives and Financial Oversight Committee. Mr. Finlay said that there was $75,000 earmarked for a feasibility study for Hemenway, and he would like to see this be done. Dr. Tremblay said they have already done this, and the Request for Qualifications (RFQ) for the Feasibility Study and will be looking to see other possible viable options in the City. Mr. Epstein asked if Barbieri's small cafeteria, that has five lunch sessions, will be looked into. Mr. Lynch said this will be looked at next year. Mr. Epstein asked about the role of online and remote instruction in the high school, and suggested offering this to students who are advanced and want more material, or for the lower-enrolled classes that sometimes get cut. Dr. Tremblay said that they have online credit recovery, and many teachers use a hybrid approach with online elements. Dr. Tremblay said they have looked at Virtual University, but would need to look at the space to do this which would come into play in the next phase of the High School Space Study. Ms. Bryant said time in actual classes also help students learn socialization, how to ask for help, and how to interact with authority figures - so we would need to balance any online classes, and use them to augment the students' experiences. Mr. Alexander asked about the use of technology such as using blizzard bags when there are snow days. Dr. Tremblay said that currently DESE has put a halt on approving any more districts using blizzard bags, in order to take a look at the districts that are currently implementing it, to see if they actually are meeting the requirements of the 180 school days. Dr. Tremblay said they are piloting a 1:1 with chromebooks in some of the schools, and will see what kind of problems they encounter, such as internet accessibility at home. Ms. Hugo said she did not see any S.M.A.R.T. goals in the Strategic Plan. Dr. Tremblay said that the Strategic Plan is the framework, and the School Improvement Plans improve upon it, and they show the percentages and S.M.A.R.T. goals, as they are different for each school. Ms. Hugo said she only saw one mention of advanced learners, and nothing about SAGE. Dr. Tremblay said the plan for these are within the budget documents, and he will also do a presentation at the next meeting with the SAGE Department Head Judy LeBlanc about the forward movement of SAGE and investments in it. He said part of the discussion at the schools with the principals is how they are differentiating between English Language Learners, gifted students and special needs students. He said that they have more work to do for gifted kids, but first they are looking to make sure they are providing for ELL and

special needs students. Mr. Alexander asked about the lottery system and what the plans are for the goal going forward. Dr. Tremblay said he is continuing to try and fix school choice every year, it is very difficult to fix and the majority of students are largely in one part of the community, while the majority of the schools are on the other side. He said there are only so many seats available in each school, and the District looks to make sure there is a good representation of our kids across all the schools; they look to spread ELL and special needs students throughout to be balanced, and there has been an increase of ELL students. He said that they were able to accommodate 91% or so, for first choices and are constantly looking to see how to make it better. He added that they are looking at this within the Equity, Diversity and Community Development Office, in conjunction with the Parent Information Center. He said he is not sure it will be fixed without considering another school, possibly on the South Side. Mr. Alexander asked if parents are getting a basic overview on how it works, when they come to place their student in the lottery, as he is getting the sense that they don't know exactly what the process is. Dr. Tremblay said they talk about it at Kindergarten Orientation Night, and provide the information in multiple languages. He said that he is striving to make every single one of the nine elementary schools desirable, then it will not matter what choice you get.

*Ms. Maskell left the meeting at 9:15 p.m
*Mr. Finlay stepped out of the meeting from 9:15-9:18 p.m.

Superintendent's Update

Mr. Lynch said that at the meeting on June 19th, he will be giving a full narrative with recommendations for any end-of-year transfers for **FY19.** He said that there is just under 80% expended, and salaries are not encumbered. He added that he will have a projected end budget for June 30th. He said that the food service negative balance will be covered by the operating budget before June 30th.

Mr. Lynch said that last night was the first reading by the City Council on the **FY20 Budget,** the second reading will be on June 18th. He said that the current District proposed budget is the 4.11% the School Committee voted on.

Ms. Bryant asked if there is currently a soft freeze. Mr. Lynch said that there was, but they are still spending money - departments and schools just have to submit what they want to expend, with information on amount and what for, to get approved; and salaries still need to be taken out.

Dr. Tremblay said that the District participates in two educational collaboratives, he is the voting member for ACCEPT and the law requires a formal vote for him to continue in that capacity.

**Motion:** To appoint Dr. Tremblay as the School Committee's representative to the ACCEPT Board of Directors for the 2019-2020 fiscal year.

**Moved:** Ms. Bryant **Seconded:** Ms. Hugo. **Vote:** Unanimous (7-0-0)

Subcommittee Reports

**Policy**

**Motion:** To approve Policy JJF: Student Activity Accounts for a first reading.

**Moved:** Ms. Hugo **Seconded:** Mr. Alexander

**Discussion:** Mr. Epstein asked for a friendly amendment within this proposed policy, as it is not clear if there are other accounts besides the agency account and the checking account, and he

thinks the structure should be explained - the hierarchy of accounts should be part of the definitions. All in agreement. Mr. Epstein will work with Mr. Lynch on adding this information.
**Vote**: Unanimous (7-0-0)

**Finance and Operations.** Mr. Epstein said that two warrants were signed. He said that the Finance Subcommittee met and the auditor will be making one amendment to the audit report in order to follow the DESE requirements. He said that then, from the subcommittee's view, the audit will look complete, acceptable, and satisfy the requirements. He said that the audits for FY19 are going to be different: Next year the School Committee will hire their own auditor as opposed to being part of the City's audit, and will be in charge of how it is done, what they should be looking for, what level should be considered acceptable, and the timeframe. Mr. Lynch said that he will look into material donations that were brought up in the subcommittee meeting, and will report on these to the subcommittee as it comes in.

Approval of Grants/Gifts/Field Trips
**Motion:** To approve the Open Session Minutes of April 24, 2019 with the suggested minor amendments.
**Moved:** Ms. Bryant **Seconded:** Mr. Finlay **Vote:** 6-0-1
(Yes: Hugo, Finlay, Freudberg, Alexander, Epstein, Bryant. Abstained: Pascual)

Adjournment
**Motion:** To adjourn.
**Moved:** Mr. Epstein **Seconded:** Mr. Finlay **Vote:** Unanimous (7-0-0)
Meeting adjourned at 9:32 p.m.

Meeting Materials
Agenda
Student Advisory Committee Presentation
Action Civics Commission Presentation on Homework Policy
BLOCKS Estimate Report
Proprietary Specification Vote for Fuller Project
Progress Report on Superintendent's Goals
FY19 Year to Date Budget
Food Services Negative Balance report
Memo on ACCEPT Collaborative Representative
Policy Summary
Policy JJF: Student Activity Account Audits
Warrants
April 24, 2019 Open Session Draft Minutes

*These minutes were approved at the School Committee Open Session held on July 17, 2019.*
*These minutes were sent to the City of Framingham for posting on July 18, 2019.*

### 3.1.5 Color Theory Statement

The material and the range of color selection choices have been reviewed by the Framingham Fuller School Building Committee and confirmed during their meeting on 7/1/19. However, by agreement with the committee, finalization of color values within those materials will be concluded during construction when availability of manufacturer's options can be confirmed prior to submittal approval. Any future color and/or material selections will not affect the materials and colors included in the cost estimates.

*Exterior:*

Color at the exterior of the new Fuller Middle School is conceived with a priority on responding to the existing context of surrounding school buildings including the adjacent Farley and McCarthy buildings. Civic or institutional buildings in Framingham tend to constructed of brick. However the Fuller/Farley/McCarthy campus is sited in the midst of a residential neighborhood. Therefore the materials and color palette for new building will be mixed with accents of artificial or 'phenolic' wood trim. The primary color will be established by the brick which has been selected on a preliminary basis in a brown/ochre to reddish range relating to the directly abutting Farley school. Mortar color will be selected to minimize contrast with the brick but without an overt color of its own.

To complement the brick, trim around the bay window projections and interspersed field accent panels have been depicted, again, on a preliminary basis, in a light to medium wood tone. The combination of reddish brown brick and wood tone reflects similar combinations of masonry and wood found in the immediate context of residences. Metal window trim will be finished with metallic paint in a similar range

of color, perhaps, as was shown on a preliminary basis, in a copper color.

*Interior:*

The color palette on the interior is set primarily by the criteria of maximizing the collection and distribution of natural light to create a bright, uplifting atmosphere throughout all spaces. Therefore the floor will be a light grey for reflectivity. Bumper rails and parapet cap trim consisting of a natural light grey bamboo finish or cohort color coded painted MDO will provide a feature horizontal accent running through all public circulation and program areas.

To provide some variation and identification of grade cohorts, lockers will be assigned colors relating to the three grade cohorts – on a preliminary basis in chartreuse, yellow, light blue and red.

Complementing the flooring material at each program space, upper wall surfaces out of student reach and painted soffits will have matching but lighter toned color. Upper exposed metal deck ceilings and light shelves will be bright white for maximum reflectivity. The auditorium and gymnasium spaces and adjacent corridors will be surfaced with low maintenance ground face CMU or CMU tile in grey concrete with primarily white aggregate – again to allow for maximum reflectivity. The auditorium will also be accented by suspended plywood acoustic reflector clouds

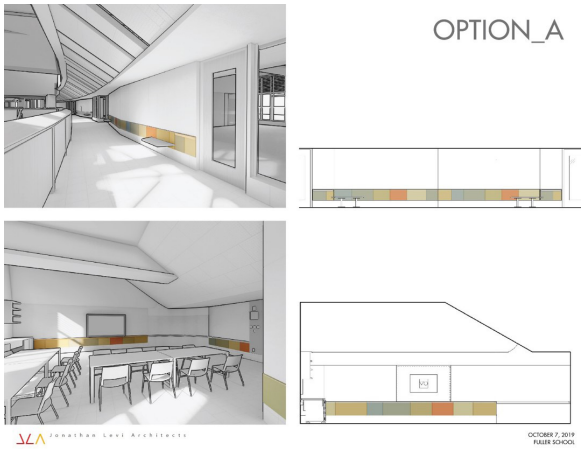
Flooring finishes presented at School Buildlign Commettee meeting 7/1/19.


Finishes presented at School Buildlign Commettee meeting 7/1/19.

Options for accent paint colors for the bumper rails in the Classrooms and Corridors were presented, and selections approved, at the 10/7/19 SBC meeting:

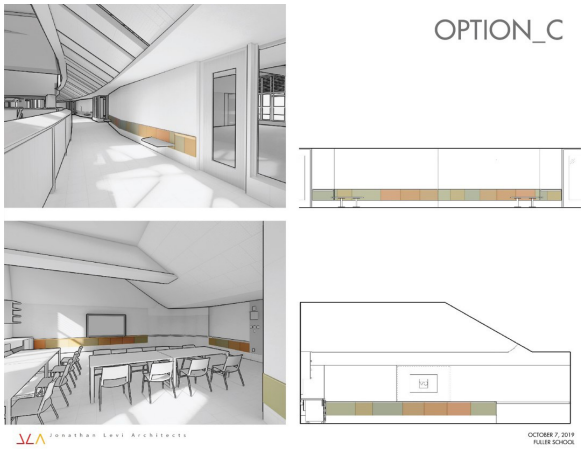
- Option A series approved for Corridors
- Option B series approved for Classrooms

Option A selected for Corridor bumper rails




Option B selected for Classroom bumper rails


Option C not selected



### 3.1.6 Independent Structure Review

Please reference the attached documentation prepared by the Independent Structural Reviewer, LeMessurier.

- Structural Peer Review letter
- Independent Structural Review Comments and Responses

September 30, 2019

Mr. Joel G. Seeley
Symmes Maini & McKee Associates, Inc.
1000 Massachusetts Avenue
Cambridge, Massachusetts 02138

Reference: New Fuller Middle School - Structural Peer Review
Framingham, Massachusetts
LeM File No. 19.0153

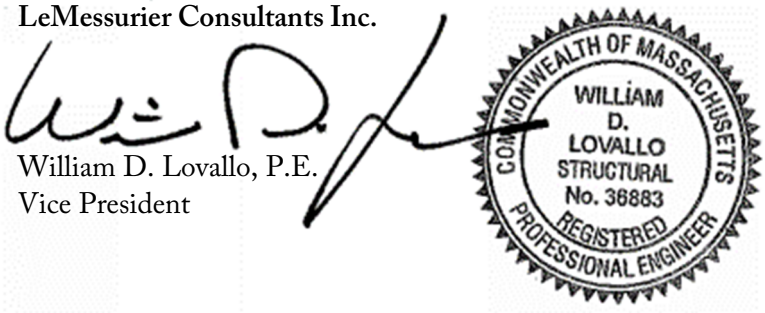
Dear Joel:

As requested, LeMessurier completed our independent structural engineering review for the referenced project in accordance with 780 CMR Section 105.9 of the Massachusetts State Building Code (Ninth Edition).

We reviewed the Construction Document structural package dated September 9, 2019 and titled 90% Construction Document Pricing Set and prepared by the structural engineer of record, RSE Associates of Watertown, Massachusetts.

We determined that the design of the building structure appears conceptually correct, and we did not discover any major errors in the design. LeMessurier concluded that the design is appropriate to conform to the prescriptive criteria of the Ninth Edition of the Massachusetts State Building Code with Amendments and with reference to the 2015 International Building Code.

Very truly yours,
**LeMessurier Consultants Inc.**




William D. Lovallo, P.E.
Vice President

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LeMessurier.

Fuller Middle School - Framingham

19.0153

Structural Peer Review Comments

| Number | Drawing | LeM Comment (2019-08-02) | Response |
|---|---|---|---|
| 1 | General | ground improvement does not appear to be defined on foundation plans, information required for bidders will include column footing loads, wall loads, and slab loads for proper design of system and bidding | RSE: Loading information has been provided on drawing S101L |
| 2 | General | details for brick relieve showing extent, elevations, connections, etc. are lacking other than typical not and section which generally leads to bidder confusion, coordination challenges, and change orders | RSE: Elevation sheets of relieving angle extent has since been provided |
| 3 | General | slab diaphragm reinforcement does not appear in set | RSE: additional reinforcement beyond what has been provided is not deemed necessary |
| 4 | General | significant architectural stairs lacking structural information – leaving these stairs up to delegated design may lead to serviceably problems, missing scope, or solutions not consisting with architectural design intent | RSE: Stair 4 stringers are by structural steel and sizes are now shown on structural drawings |
| 5 | General | no slab edge bent plate information provided – example is interior atrium slab edge on architectural drawings shows structural steel slab edge | RSE: atrium slab edge details have since been provided. |
| 6 | General | footing elevations not clearly defined on plans | RSE: all bottoms of footing elevations have since been provided |
| 7 | General | hanger details in atrium do not appear in set | RSE: Details are still in development |
| 8 | S101C | grade beam reinforcement does not appear in set | RSE: information has since been provided |
| 9 | S101D | reinforcement for footing under breakout space does not appear in set | RSE: information has since been provided |

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Fuller Middle School - Framingham

19.0153 Structural Peer Review Comments

| Number | Drawing | LeM Comment (2019-08-02) | Response |
|---|---|---|---|
| 10 | S102A | symbol shows 5.5 on arrow but no description of system is provided | RSE: The legend has since been updated to reflect this comment |
| 11 | S102C | breakout space structure noted as designed by others however no structural loading, load, path, configuration, connection details to base building structure, minimum ratings, etc. provided for delegated design | RSE: information has since been provided |
| 12 | S103A | structure for chimney does not appear in set | RSE: Details are still in development |
| 13 | S103C | how will bottom/top of stair be detailed to accommodate anticipated roof deflection from snow that is translated down to stair landing at level 3 | RSE: See response to #20 |
| 14 | S103C<br>S103D | RTU support on 1½" steel roof deck may require supplemental steel support between roof purlins | RSE: Steel dunnage and concrete roof curbs have since been provided under mechanical units |
| 15 | S103D | RTU 5 and 6 labeled as 48,000 pounds – distribution of this load onto joists is not clear – platform is noted but not shown | RSE: Loads have since been clearly communicated for joist design |
| 16 | S103D | roof joists appear to be missing uplift bridging at first bottom panel point | RSE: uplift bridging lines have since been shown to reflect this comment |
| 17 | S103D | sloping roofs over gymnasium and auditorium not described in set including tops of sloping masonry walls and associated details | RSE: sloping roof bottoms of deck geometry has since been defined |
| 18 | S103D | joist loading diagrams do not appear in drawing set | RSE: joist loading diagrams have since been fully developed |

LeMessurier.

Fuller Middle School - Framingham
19.0153

Structural Peer Review Comments

| Number | Drawing | LeM Comment (2019-08-02) | Response |
|---|---|---|---|
| 19 | S104C | detail connections not shown for small beams framing into large flange sections at significant skewed angles – beams likely fail in shear requiring reinforcement or size change | RSE: beam sizes have been adjusted at severe skews to assure connections will not fail |
| 20 | S104B<br>S104C | review of anticipated deflections of supporting girders over atrium with hung floor and superimposed roof loads should consider sequence of construction, camber on roof, and camber at hung floors, strain on hangers, and anticipated deflections at floors based on roof deflections | RSE: Deflection is within reasonable limits since the stair hangers are near the end of roof beam spans. Roof beam live load deflection criteria has also been tightened to 1.5" max at midspan (~L/600 for longest roof beam span). Hanger connections will have vertical adjustability to account for erection sequencing. |
| 21 | S104C | no details shown for support of large skylights on edge of roof framing | RSE: detail has since been included |
| 22 | S105B | lateral stability of stair roof may be lacking (same for elevator roof) | RSE: stair and elevator pop ups have since been moment framed |
| 23 | S202 | bracing elevations do not include connection design forces | RSE: braced frame forces have since been included |
| 24 | S500 | section 4 does not include weld sizes for coped beam reinforcement | RSE: weld sizes have since been included |
| 25 | S303<br>S400 | base plate details do not appear to be coordinated with perimeter foundation sections | RSE: base plate designs have since been finalized and coordinated with the perimeter geometry |
| 26 | General | loading conditions for roof does not define ponding – confirm ponding depth is considered for secondary drainage system and/or overflow | RSE: the secondary roof drain scuppers are less than 7" above roof level and therefore roof ponding doesn't govern over snow loading. |

### 3.1.7 Quality Control Documents

JLA's primary approach to Quality Control/Quality Assurance is the full team's integration of Building Information Modeling (BIM). BIM documentation for the
Fuller Middle School commenced with schematic design and is continually updated and maintained through the present submission.

The success of QA/QC during document production relies heavily on the adoption, full and complete documentation and coordination of all information through BIM by all primary disciplines including architectural, structural, HVAC, plumbing, electrical and fire protection. JLA, together with structural engineer RSE Assoc., ME engineers Garcia, Galuska, DeSousa, and Plumbing & Fire Protection engineers AKAL Engineering share a BIM platform through the utilization of REVIT 2020. We have also since included A/V and Food Service BIM models.

Throughout the Construction Documents phase, the increasingly comprehensive REVIT model has been uploaded each week on Wednesday and shared between this core design team. Each week, the members of the individual discipline staffs review issues of conflict and coordination. We also utilize google documents for each discipline in order to record action items and progress.

In addition, the team's integrated design methodology is implemented through regular in-person sessions in the JLA studio with all primary and relevant secondary disciplines (such as acoustics). During these sessions coordination action items are identified, tasks assigned and resolution paths are scheduled.

Some highlights on each topic are below:

*Ceiling Heights*
BIM model shows all duct and piping sizes for coordination purposes.

*Mechanical Room and Shaft Sizes*
BIM model shows all duct and piping sizes for coordination purposes.

*Coordinate Specifications and Drawings*
JLA provides marked up specifications to our spec writer for incorporation into the project manual.

*Filed Sub-Bid Work*
Spec writer provides a public bid check document to OPM & JLA. This provides key information for spec writer to incorporate into the entire project manual.

*Scheduling*
The OPM, CM, and Architect meet and agree on scheduling items on a weekly basis.

*Equipment and Power*
We have had various meetings with the users of the current and proposed fuller middle school. This is so we can understand their equipment needs in order to include provisions in the construction documents.

*Existing and New Construction*
The benefit of having a Construction Manager perform pre-construction services for the client aid in the development of coordination items related to the old fuller middle school which will be demolished after the proposed fuller middle school is completed.

Phasing
The benefit of having a Construction Manager perform pre-construction services for the client aid in the development of phasing.

In addition, two complete progress check sets of both drawings and specifications were produced for redline review and mark up by Associate Principal Mark Warner and Principal in Charge, Architect of Record, Jonathan Levi. Remaining 90% CD appropriate coordination issues were then distributed to the team and picked up prior to final 90% CD submission.

Finally, the 90% pricing set was reviewed by both the OPM and commissioning agent, with detailed comments tracked.

### 3.1.8 Security and Visual Access Requirements

*City Representatives Consulted:*
The design team has met with representatives of the Framingham Police Department and Framingham Fire department on 2/6/18, 4/5/18, 7/30/18, 3/11/19, 4/8/19, 6/28/19, 7/29/19 and 10/8/19 to consult on the planning process for both site and building design issues. The Director of Safety and Security for the Framingham Public School District participated as well in the meetings held during the Design Development and CD phases. Their input has been included in the project. Included in these meetings were discussions of:

- Main entrance design
- Emergency Medical Procedures
- Ballistic glazing treatments
- Classroom hardware (thumb turn lock function from interior, key lock function from exterior
- Classroom Visibility – manual shades at interior and exterior windows
- Alternative entry locations, knox boxes
- Emergency vehicle access around entire building
- CCTV camera surveillance
- Site Phasing Plans
- Construction Traffic

*General Description:*
The floor plan of the new school has been organized to allow for a prudent balance between the need for school security and the need for a warm and welcoming environment for the grades 6 through 8 population. The transparency and interconnectedness, which are desirable features of the educational program, also make for a favorable scheme for internal school security. The open floor plans provide a high degree of visual access from one portion of the school to another. This has been enhanced through the fine adjustment of classroom corridors to allow sightlines to connect the far corners of the school, including all 3 floors. All the classroom corridors include passive supervision from both teacher planning spaces and cohort commons.

The new building design locates the medical office adjacent to the main entry and central administration, which allows the emergency medical responders ideal access. This is a substantial improvement from the existing Fuller School design, which has the medical office remotely located from the entry. In the event of a medical emergency, the nurse calls 911, and both the Fire Department and EMS arrive at the school, are met by central administration personnel, and escorted to the medical area. The project includes all site and building signage required by Framingham's emergency procedures to identify locations where first responders may more directly reach a person needing medical attention. The elevator has been sized to accommodate a gurney, in the event that is required to move an injured person to the medical area.

A Knox Box is provided at both the main entry and the community entry, with an annunciator panel and graphic map located in each of the associated vestibules. Per discussions with the Framingham Police and Fire Departments, building plans will be delivered to each of these departments as part of the building permit process. FPD and FFD have indicated that it is anticipated that the "Command Center" in an emergency would be outside of the building, so no special location has been so designated inside the building itself.

Regarding security for the school from the visitors' perspective, the middle school central administration has been located adjacent to the main entrance of the school at the second floor level. Broad expanses of glass will allow observation of approaching visitors from the main school reception desk to the entrance approach and to the vestibule. The main entrance approach is configured with an outer covered area and an inner vestibule. The progress of an intruder can therefore be impeded at either line of doors. It is intended that the vestibule will be attended by administrative personnel facing into the vestibule from the central administration area. The administration area is safeguarded behind a glass wall partition with a locking door.

Upon arriving, visitors will follow the following procedure:

1. Visitors will ring the bell located at the exterior door:
2. Through the voice intercom system, visitors will be asked to identify themselves and if they have an appointment in the building.
3. Once this information is received and verified for accuracy, visitors will be let into the vestibule.
4. Visitors will need to present driver's license which must be queried through the school's background check system.
5. After passing clearance, visitors will be issued a visitor badge.
6. Visitors who do not gain clearance, may be asked to leave the building immediately.
7. Anyone given a visitor badge cannot be left unattended in the building and will have staff accompany them to the designated location.
8. No visitor can ever be left unattended.

In the instance of an intruder who has successfully passed through the outer security measures of the school an intruder alarm system can be triggered. Additionally, all classrooms will be provided with roll down shades at windows facing the corridor, so that an intruder could not look directly into classrooms.

It should be noted that the intruder alarm strategy will not interfere with life safety issues during a fire alarm.

In order to allow for community access, the school is also compartmentalized for usage modes in addition to that uses during school hours. Access will be allowed through the west entrance

vestibule to allow the community to utilize the auditorium and athletic facilities, and the ground floor locker rooms. This vestibule will be outfitted with security cameras and electronic door locking hardware, which may be accessed and operated remotely by building security. Sliding metal fabric partitions will prevent access to the main school space.

## 3.2 Space Summary

### 3.2.1 Space Summary

Please reference the attached updated CD-90% Space Summary.

# *Proposed Space Summary - Middle Schools*

= Change from MSBA Template over 5%

= Change from 8/9/19 60% CD Submission over 5%

**Date: 10/18/2019 90% Construction Documents**

| FULLER Middle School<br>630 Students Grades 6-8 | Existing Conditions | | | Schematic Design | | | Design Development 5/17/19 | | | Design Development MSBA Comment Response 6/21/19 | | | Construction Documents 60% 8/9/19 | | | Construction Documents 90% 10/18/19 | | | MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROOM TYPE | ROOM NFA[1] | # OF RMS | area totals | ROOM NFA[1] | # OF RMS | area totals | ROOM NFA[1] | # OF RMS | area totals | ROOM NFA[1] | # OF RMS | area totals | ROOM NFA[1] | # OF RMS | area totals | ROOM NFA[1] | # OF RMS | area totals | ROOM NFA[1] | # OF RMS | area totals | Comments |
| **CORE ACADEMIC SPACES** | | | **31,685** | | | **36,000** | | | **35,600** | | | **35,600** | | | **35,530** | | | **35,530** | | | **29,580** | |
| *(List classrooms of different sizes separately)* | | | | | | | | | | | | | | | | | | | | | | |
| Classroom - General | 775 | 20 | 15,500 | 900 | 21 | 18,900 | 885 | 21 | 18,585 | 885 | 21 | 18,585 | 885 | 21 | 18,585 | 885 | 21 | 18,585 | 950 | 22 | 20,900 | 850 SF min - 950 SF max, includes closet |
| ELL Classrooms | 675 | 9 | 6,075 | 900 | 6 | 5,400 | 885 | 6 | 5,310 | 885 | 6 | 5,310 | 885 | 6 | 5,310 | 885 | 6 | 5,310 | | | | includes closet |
| Teacher Planning | 0 | 0 | 0 | 90 | 15 | 1,350 | 95 | 15 | 1,425 | 95 | 15 | 1,425 | 95 | 15 | 1,425 | 95 | 15 | 1,425 | | | | Shared between classrooms |
| Classroom Breakout | 0 | 0 | 0 | 290 | 7 | 2,030 | 290 | 7 | 2,030 | 290 | 7 | 2,030 | 280 | 7 | 1,960 | 280 | 7 | 1,960 | | | | Shared between classrooms. Includes SPED use |
| Small Group Seminar (20-30 seats) / Resource | 0 | 0 | 0 | 400 | 1 | 400 | 405 | 1 | 405 | 405 | 1 | 405 | 405 | 1 | 405 | 405 | 1 | 405 | 500 | 2 | 1,000 | Professional Development/ Itinerant / Workspace. Some uses served in Admin "Teachers Work Rooms" |
| Science Classroom / Lab | 915 | 10 | 9,150 | 1,195 | 6 | 7,170 | 1,180 | 6 | 7,080 | 1,180 | 6 | 7,080 | 1,180 | 6 | 7,080 | 1,180 | 6 | 7,080 | 1,200 | 6 | 7,200 | |
| Prep Room | 240 | 4 | 960 | 80 | 6 | 480 | 80 | 6 | 480 | 80 | 6 | 480 | 80 | 6 | 480 | 80 | 6 | 480 | 80 | 6 | 480 | |
| Science Teacher Planning | 0 | 0 | 0 | 90 | 3 | 270 | 95 | 3 | 285 | 95 | 3 | 285 | 95 | 3 | 285 | 95 | 3 | 285 | | | | Shared between classrooms |
| **SPECIAL EDUCATION** | | | **10,875** | | | **9,150** | | | **9,075** | | | **9,075** | | | **9,075** | | | **9,150** | | | **7,550** | |
| *(List classrooms of different sizes separately)* | | | | | | | | | | | | | | | | | | | | | | |
| Self-Contained SPED | 930 | 5 | 4,650 | 900 | 6 | 5,400 | 885 | 6 | 5,310 | 885 | 6 | 5,310 | 885 | 6 | 5,310 | 900 | 6 | 5,400 | 950 | 5 | 4,750 | All match SD figures |
| SPED Teacher Planning | 0 | 0 | 0 | 90 | 3 | 270 | 95 | 3 | 285 | 95 | 3 | 285 | 95 | 3 | 285 | 90 | 3 | 270 | | | | All match SD figures |
| SPED Classroom Breakout | 620 | 7 | 4,340 | 300 | 2 | 600 | 300 | 2 | 600 | 300 | 2 | 600 | 300 | 2 | 600 | 300 | 2 | 600 | | | | Shared between classrooms. SPED use also in Gen Classroom Breakout |
| Self-Contained SPED Toilet | 0 | 0 | 0 | 95 | 3 | 285 | 95 | 3 | 285 | 95 | 3 | 285 | 95 | 3 | 285 | 95 | 3 | 285 | 60 | 5 | 300 | For medically fragile students |
| Resource Room | 935 | 1 | 935 | 520 | 3 | 1,560 | 520 | 3 | 1,560 | 520 | 3 | 1,560 | 520 | 3 | 1,560 | 520 | 3 | 1,560 | 500 | 3 | 1,500 | Should be divisible |
| Small Group Room / Reading | 0 | 0 | 0 | 345 | 3 | 1,035 | 345 | 3 | 1,035 | 345 | 3 | 1,035 | 345 | 3 | 1,035 | 345 | 3 | 1,035 | 500 | 2 | 1,000 | Allows division into 2 smaller spaces |
| SPED Office w/Storage | 190 | 5 | 950 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| **ART & MUSIC** | | | **5,620** | | | **3,675** | | | **3,640** | | | **3,640** | | | **3,640** | | | **3,640** | | | **3,250** | |
| Art Classroom | 600 | 2 | 1,200 | 1,185 | 1 | 1,185 | 1,175 | 1 | 1,175 | 1,175 | 1 | 1,175 | 1,175 | 1 | 1,175 | 1,175 | 1 | 1,175 | 1,200 | 1 | 1,200 | assumed use - 50% population 2 times / week |
| Art Workroom w/ Storage & kiln | 0 | 0 | 0 | 150 | 1 | 150 | 80 | 2 | 160 | 80 | 2 | 160 | 80 | 2 | 160 | 80 | 2 | 160 | 150 | 1 | 150 | separated kiln room |
| Band / Chorus - 100 seats | 2,120 | 2 | 4,240 | 970 | 2 | 1,940 | 950 | 2 | 1,900 | 950 | 2 | 1,900 | 950 | 2 | 1,900 | 950 | 2 | 1,900 | 1,500 | 1 | 1,500 | For 70 students, Includes Teacher Planning space and music storage |
| Music Practice / Ensemble | 60 | 3 | 180 | 200 | 2 | 400 | 135 | 3 | 405 | 135 | 3 | 405 | 135 | 3 | 405 | 135 | 3 | 405 | 200 | 2 | 400 | includes additional, larger ensemble space |
| **VOCATIONS & TECHNOLOGY** | | | **3,350** | | | **3,170** | | | **3,185** | | | **3,185** | | | **3,150** | | | **3,150** | | | **6,400** | Distributed V&T in Cohort Commons |
| Tech Clrm. - (E.G. Drafting, Business) | 1,660 | 1 | 1,660 | 950 | 0 | 0 | 950 | 0 | 0 | 950 | 0 | 0 | 950 | 0 | 0 | 950 | 0 | 0 | 1,200 | 2 | 2,400 | Functions to be served in Fab Lab |
| Tech Shop - (E.G. Consumer, Wood) | 1,690 | 1 | 1,690 | 1,980 | 1 | 1,980 | 1,960 | 1 | 1,960 | 1,960 | 1 | 1,960 | 1,960 | 1 | 1,960 | 1,960 | 1 | 1,960 | 2,000 | 2 | 4,000 | Assumed use - 25% Population - 5 times/week |
| Fab Lab | 0 | 0 | 0 | 1,190 | 1 | 1,190 | 1,225 | 1 | 1,225 | 1,225 | 1 | 1,225 | 1,190 | 1 | 1,190 | 1,190 | 1 | 1,190 | | | | Includes closed off area for 3D printers area closer to MSBA Tech classroom standard |
| **HEALTH & PHYSICAL EDUCATION** | | | **24,265** | | | **9,985** | | | **9,795** | | | **9,795** | | | **9,765** | | | **9,765** | | | **8,400** | |
| Gymnasium | 9,680 | 1 | 9,680 | 8,300 | 1 | 8,300 | 8,265 | 1 | 8,265 | 8,265 | 1 | 8,265 | 8,265 | 1 | 8,265 | 8,265 | 1 | 8,265 | 6,000 | 1 | 6,000 | Gym enlarged to fit 2 MS BB Courts |
| Gym Storeroom | 260 | 2 | 520 | 300 | 1 | 300 | 315 | 1 | 315 | 315 | 1 | 315 | 315 | 1 | 315 | 315 | 1 | 315 | 150 | 1 | 150 | |
| Health Instructor's Office w/ Shower & Toilet | 685 | 3 | 2,055 | 150 | 2 | 300 | 150 | 2 | 300 | 150 | 2 | 300 | 150 | 2 | 300 | 150 | 2 | 300 | 250 | 1 | 250 | PE instructor - no shower or toilet |
| Locker Rooms - Boys / Girls w/ Toilets | 3,500 | 2 | 7,000 | 500 | 2 | 1,000 | 415 | 2 | 830 | 415 | 2 | 830 | 400 | 2 | 800 | 400 | 2 | 800 | 1,000 | 2 | 2,000 | 3 toilets, no shower, 40 lockers |
| Unisex Toilet / Shower | 140 | 1 | 140 | 85 | 1 | 85 | 85 | 1 | 85 | 85 | 1 | 85 | 85 | 1 | 85 | 85 | 1 | 85 | | | | Include 4 lockers |
| Fitness Center | 4,870 | 1 | 4,870 | | | | | | | | | | | | | | | | | | | |
| **MEDIA CENTER** | | | **3,720** | | | **6,280** | | | **6,250** | | | **6,250** | | | **6,250** | | | **6,085** | | | **4,003** | |
| Media Center / Reading Room | 3,720 | 1 | 3,720 | 1,990 | 1 | 1,990 | 1,990 | 1 | 1,990 | 1,990 | 1 | 1,990 | 1,990 | 1 | 1,990 | 1,990 | 1 | 1,990 | 4,003 | 1 | 4,003 | |
| Cohort Commons | 0 | 0 | 0 | 1,430 | 3 | 4,290 | 1,420 | 3 | 4,260 | 1,420 | 3 | 4,260 | 1,420 | 3 | 4,260 | 1,365 | 3 | 4,095 | | | | Distributed Media Center and Vocations and Technology functions |
| **DINING & FOOD SERVICE** | | | **13,740** | | | **8,960** | | | **8,690** | | | **8,840** | | | **8,840** | | | **8,840** | | | **8,922** | |
| Cafetorium / Dining | 8,570 | 1 | 8,570 | 4,725 | 1 | 4,725 | 4,725 | 1 | 4,725 | 4,725 | 1 | 4,725 | 4,725 | 1 | 4,725 | 4,725 | 1 | 4,725 | 4,725 | 1 | 4,725 | 2 seatings - 15SF per seat |
| Stage | 0 | 0 | 0 | 1,590 | 1 | 1,590 | 1,510 | 1 | 1,510 | 1,510 | 1 | 1,510 | 1,510 | 1 | 1,510 | 1,510 | 1 | 1,510 | 1,600 | 1 | 1,600 | |
| Chair / Table / Equipment Storage | 440 | 1 | 440 | 430 | 1 | 430 | 270 | 1 | 270 | 420 | 1 | 420 | 420 | 1 | 420 | 420 | 1 | 420 | 410 | 1 | 410 | Area shared with additional custodial storage |
| Kitchen | 3,485 | 1 | 3,485 | 1,915 | 1 | 1,915 | 1,820 | 1 | 1,820 | 1,820 | 1 | 1,820 | 1,820 | 1 | 1,820 | 1,820 | 1 | 1,820 | 1,930 | 1 | 1,930 | 1600 SF for first 300 + 1 SF/student Add'l, includes Dry Storage, Office, Toilet, Scramble |
| Staff Lunch Room | 1,245 | 1 | 1,245 | 300 | 1 | 300 | 365 | 1 | 365 | 365 | 1 | 365 | 365 | 1 | 365 | 365 | 1 | 365 | 258 | 1 | 258 | Allows teacher collaboration |
| **MEDICAL** | | | **1,560** | | | **610** | | | **620** | | | **620** | | | **620** | | | **610** | | | **610** | |
| Medical Suite Toilet | 50 | 3 | 150 | 60 | 1 | 60 | 60 | 1 | 60 | 60 | 1 | 60 | 60 | 1 | 60 | 60 | 1 | 60 | 60 | 1 | 60 | |
| Nurses' Office / Waiting Room | 930 | 1 | 930 | 250 | 1 | 250 | 260 | 1 | 260 | 260 | 1 | 260 | 260 | 1 | 260 | 250 | 1 | 250 | 250 | 1 | 250 | includes interview room/ closet/ kitchenette |
| Examination Room / Resting | 160 | 3 | 480 | 100 | 3 | 300 | 100 | 3 | 300 | 100 | 3 | 300 | 100 | 3 | 300 | 100 | 3 | 300 | 100 | 3 | 300 | |
| **ADMINISTRATION & GUIDANCE** | | | **4,600** | | | **5,250** | | | **5,245** | | | **5,245** | | | **5,235** | | | **5,235** | | | **3,430** | |
| General Office / Waiting Room / Toilet | 1,540 | 1 | 1,540 | 425 | 1 | 425 | 445 | 1 | 445 | 445 | 1 | 445 | 445 | 1 | 445 | 445 | 1 | 445 | 415 | 1 | 415 | |
| Teachers' Mail and Time Room | 100 | 1 | 100 | 95 | 1 | 95 | 100 | 1 | 100 | 100 | 1 | 100 | 100 | 1 | 100 | 100 | 1 | 100 | 100 | 1 | 100 | |
| Duplicating Room | 130 | 1 | 130 | 200 | 1 | 200 | 200 | 1 | 200 | 200 | 1 | 200 | 200 | 1 | 200 | 200 | 1 | 200 | 200 | 1 | 200 | |
| Records Room | 90 | 1 | 90 | 200 | 1 | 200 | 210 | 1 | 210 | 210 | 1 | 210 | 210 | 1 | 210 | 210 | 1 | 210 | 200 | 1 | 200 | |
| Principal's Office w/ Conference Area | 560 | 1 | 560 | 375 | 1 | 375 | 480 | 1 | 480 | 480 | 1 | 480 | 470 | 1 | 470 | 470 | 1 | 470 | 375 | 1 | 375 | includes toilet |
| Principal's Secretary / Waiting | 80 | 1 | 80 | 125 | 1 | 125 | 130 | 1 | 130 | 130 | 1 | 130 | 130 | 1 | 130 | 130 | 1 | 130 | 125 | 1 | 125 | |
| Assistant Principal's Office - AP1 | 110 | 1 | 110 | 150 | 1 | 150 | 150 | 1 | 150 | 150 | 1 | 150 | 150 | 1 | 150 | 150 | 1 | 150 | 150 | 1 | 150 | |
| Assistant Principal's Office - AP2 | 0 | 0 | 0 | 150 | 0 | 0 | 150 | 0 | 0 | 150 | 0 | 0 | 150 | 0 | 0 | 150 | 0 | 0 | 150 | 1 | 150 | |
| Supervisory / Spare Office | 170 | 1 | 170 | 150 | 1 | 150 | 145 | 1 | 145 | 145 | 1 | 145 | 145 | 1 | 145 | 145 | 1 | 145 | 150 | 1 | 150 | |
| Conference Room | 310 | 1 | 310 | 350 | 1 | 350 | 365 | 1 | 365 | 365 | 1 | 365 | 365 | 1 | 365 | 365 | 1 | 365 | 350 | 1 | 350 | includes closet |
| Small Conference Room | 0 | 0 | 0 | 210 | 1 | 210 | 205 | 1 | 205 | 205 | 1 | 205 | 205 | 1 | 205 | 205 | 1 | 205 | | | | For parent meetings |
| Guidance Office (Student Support) | 170 | 8 | 1,360 | 150 | 6 | 900 | 150 | 6 | 900 | 150 | 6 | 900 | 150 | 6 | 900 | 150 | 6 | 900 | 150 | 4 | 600 | Distributed 2 per cohort |
| Guidance Waiting Room W/ Sto Closet | 0 | 0 | 0 | 75 | 3 | 225 | 75 | 3 | 225 | 75 | 3 | 225 | 75 | 3 | 225 | 75 | 3 | 225 | 100 | 1 | 100 | Distributed 1 per cohort |
| Guidance Storeroom | 60 | 1 | 60 | 15 | 3 | 45 | 15 | 3 | 45 | 15 | 3 | 45 | 15 | 3 | 45 | 15 | 3 | 45 | 50 | 1 | 50 | Distributed 1 per cohort |
| Teachers' Work Room | | | 0 | 300 | 3 | 900 | 200 | 3 | 600 | 200 | 3 | 600 | 200 | 3 | 600 | 200 | 3 | 600 | 465 | 1 | 465 | Distributed 1 per cohort. Serves uses of removed Small Seminar Rooms |

# *Proposed Space Summary - Middle Schools*

= Change from MSBA Template over 5%

= Change from 8/9/19 60% CD Submission over 5%

**Date: 10/18/2019 90% Construction Documents**

| FULLER Middle School<br>630 Students Grades 6-8 | Existing Conditions | | | Schematic Design | | | Design Development 5/17/19 | | | Design Development MSBA Comment Response 6/21/19 | | | Construction Documents 60% 8/9/19 | | | Construction Documents 90% 10/18/19 | | | MSBA Guidelines (refer to MSBA Educational Program & Space Standard Guidelines) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROOM TYPE | ROOM NFA[1] | # OF RMS | area totals | ROOM NFA[1] | # OF RMS | area totals | ROOM NFA[1] | # OF RMS | area totals | ROOM NFA[1] | # OF RMS | area totals | ROOM NFA[1] | # OF RMS | area totals | ROOM NFA[1] | # OF RMS | area totals | ROOM NFA[1] | # OF RMS | area totals | Comments |
| Dept Head / Coach offices | 90 | 1 | 90 | 150 | 6 | 900 | 150 | 6 | 900 | 150 | 6 | 900 | 150 | 6 | 900 | 150 | 6 | 900 | 150 | 6 | 900 | Distributed 2 per cohort |
| Office / Conference Room | | | | | | | 145 | 1 | 145 | 145 | 1 | 145 | 145 | 1 | 145 | 145 | 1 | 145 | | | | Allows for shared collaboration space |
| **CUSTODIAL & MAINTENANCE** | | | **3,515** | | | **2,140** | | | **2,630** | | | **2,480** | | | **2,555** | | | **2,545** | | | **2,105** | |
| Custodian's Office | 100 | 1 | 100 | 165 | 1 | 165 | 385 | 1 | 385 | 385 | 1 | 385 | 385 | 1 | 385 | 385 | 1 | 385 | 150 | 1 | 150 | includes custodial staff break area/ lockers, toilet area |
| Custodian's Workshop | 250 | 1 | 250 | 250 | 1 | 250 | 250 | 1 | 250 | 250 | 1 | 250 | 250 | 1 | 250 | 250 | 1 | 250 | 250 | 1 | 250 | |
| Custodian's Storage | 105 | 9 | 945 | 130 | 3 | 390 | 105 | 4 | 420 | 90 | 3 | 270 | 110 | 3 | 330 | 110 | 3 | 330 | 375 | 1 | 375 | |
| Recycling Room / Trash | 0 | 0 | 0 | 400 | 1 | 400 | 395 | 1 | 395 | 395 | 1 | 395 | 395 | 1 | 395 | 395 | 1 | 395 | 400 | 1 | 400 | |
| Receiving and General Supply | 220 | 1 | 220 | 310 | 1 | 310 | 310 | 1 | 310 | 310 | 1 | 310 | 310 | 1 | 310 | 310 | 1 | 310 | 310 | 1 | 310 | |
| Storeroom | 1,240 | 1 | 1,240 | 145 | 3 | 435 | 120 | 3 | 360 | 120 | 3 | 360 | 125 | 3 | 375 | 125 | 3 | 375 | 420 | 1 | 420 | alternates with Academic Storage |
| Network / Telecom Room | 380 | 2 | 760 | 190 | 1 | 190 | 200 | 1 | 200 | 200 | 1 | 200 | 200 | 1 | 200 | 200 | 1 | 200 | 200 | 1 | 200 | includes head end and IDF rooms |
| Outdoor Equipment Storage | | | | | | | 310 | 1 | 310 | 310 | 1 | 310 | 310 | 1 | 310 | 300 | 1 | 300 | | | | outdoor equipment storage |
| **OTHER** | | | **27,670** | | | **6,700** | | | **6,755** | | | **6,755** | | | **6,630** | | | **6,705** | | | **0** | |
| Other *(specify)* | | | | | | | | | | | | | | | | | | | | | | |
| Adult ESL Offices | 2,370 | 1 | 2,370 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | | | | |
| City Offices, (PIC, Bldg& Grounds, BOH) | 17,300 | 1 | 17,300 | | | | | | | | | | | | | | | | | | | |
| Auditorium | 5,400 | 1 | 5,400 | 4,200 | 1 | 4,200 | 4,405 | 1 | 4,405 | 4,405 | 1 | 4,405 | 4,435 | 1 | 4,435 | 4,390 | 1 | 4,390 | | | | |
| Stage | 1,900 | 1 | 1,900 | 1,600 | 1 | 1,600 | 1,590 | 1 | 1,590 | 1,590 | 1 | 1,590 | 1,555 | 1 | 1,555 | 1,530 | 1 | 1,530 | | | | |
| Auditorium Storage | 160 | 1 | 160 | 400 | 1 | 400 | 120 | 3 | 360 | 120 | 3 | 360 | 100 | 3 | 300 | 125 | 3 | 375 | | | | Larger auditorium storage closer to approved SD area |
| Dressing Rooms | 270 | 2 | 540 | 250 | 2 | 500 | 200 | 2 | 400 | 200 | 2 | 400 | 170 | 2 | 340 | 205 | 2 | 410 | | | | Larger dressing rooms closer to approved SD area |
| Total Building Net Floor Area (NFA) | | | **130,600** | | | **91,920** | | | **91,485** | | | **91,485** | | | **91,290** | | | **91,255** | | | **74,250** | |
| Proposed Student Capacity / Enrollment | | | | | | | | | | | | | | | | | | | | | **630** | |
| **NON-PROGRAMMED SPACES** | | | | | % of GFA | **44,870** | | % of GFA | **45,275** | | % of GFA | **45,275** | | % of GFA | **45,810** | | % of GFA | **45,845** | | | | |
| Other Occupied Rooms (list separately) | | | | | 0% | | | 0% | | | 0% | | | 0% | | | 0% | | | | | Non-Programmed space areas are |
| Unoccupied MEP/FP Spaces | | | | | 1% | 1,685 | | 1% | 1,415 | | 1% | 1,415 | | 1% | 1,400 | | 1% | 1,410 | | | | Design Development Submittal |
| Unoccupied Closets, Supply Rooms & Storage Rooms | | | | | 0% | 235 | | 0% | 280 | | 0% | 280 | | 0% | 350 | | 0% | 350 | | | | 60% Construction Documents |
| Toilet Rooms | | | | | 3% | 3,560 | | 2% | 3,325 | | 2% | 3,325 | | 2% | 2,970 | | 2% | 2,980 | | | | 90% Construction Documents |
| Circulation (corridors, stairs, ramps & elevators) | | | | | 25% | 34,175 | | 19% | 25,970 | | 19% | 25,970 | | 19% | 26,350 | | 19% | 26,195 | | | | Final Construction Documents |
| Remaining[3] | | | | | 4% | **5,215** | | 10% | **14,285** | | 10% | **14,285** | | 11% | **14,740** | | 11% | **14,910** | | | | |
| Total Building Gross Floor Area (GFA)[2] | | | 195,900 | | | **136,790** | | | **136,760** | | | **136,760** | | | **137,100** | | | **137,100** | | | **107,280** | includes wall thickness change at e/w side corridors from curtainwall to brick assembly and added circulation area for auditorium vestibule interior discharge |
| Grossing factor (GFA/NFA) | | | **1.50** | | | **1.49** | | | **1.49** | | | **1.49** | | | **1.50** | | | **1.50** | | | **1.44** | |

[1] **Individual Room Net Floor Area (NFA)** Includes the net square footage measured from the inside face of the perimeter walls and includes all specific spaces assigned to a particular program area including such spaces as non-communal toilets and storage rooms.

[2] **Total Building Gross Floor Area (GFA)** Includes the entire building gross square footage measured from the outside face of exterior walls

[3] **Remaining** Includes exterior walls, interior partitions, chases, and other areas not listed above. Do not calculate this area, it is assumed to equal the difference between the Total Building Gross Floor Area and area not accounted for above.

**Architect Certification**

I hereby certify that all of the information provided in this "Proposed Space Summary" is true, complete and accurate and, except as agreed to in writing by the Massachusetts School Building Authority, in accordance with the guidelines, rules, regulations and policies of the Massachusetts School Building Authority to the best of my knowledge and belief. A true statement, made under the penalties of perjury.

**Name of Architect Firm:** Jonathan Levi Architects

**Name of Principal Architect:** Jonathan Levi

**Signature of Principal Architect:**

**Date:** 10/15/2019

### 3.2.2 Space Summary - Education Program Comparison

The overall Fuller Middle School parti documented in Schematic Design has been carried forward with the pedagogical objectives described in the Education Plan unchanged. There have been a few refinements which are outlined below, mostly from minor adjustments resulting from building design efforts. Any changes over 5% of nsf floor area have been highlighted in orange in the attached Proposed Space Summary. Overall, the total educational NSF has gone down by 35 sf from 91,290 nsf to 91,255 nsf since the previous submission. The building is designed, with a grossing factor of 1.50. The overall gsf has gone up 310 sf from SD and is unchanged from the previous submission at 137,100 gsf. This change in gsf resulted primarily from a change from a curtainwall enclosure to a more cost effective storefront / brick system, which has thicker walls, and therefore expanded the exterior perimeter by a few inches around much of the building footprint.

*Core Academic Spaces*

Total NSF of 35,530 remains unchanged from the previous submission, and remains 470 nsf less than the SD submission.

*Special Education*

The Special Education room configuration and 9,150 NSF are as approved by the DESE September 27, 2018.

*Art and Music*

Total NSF of 3,640 sf remains unchanged from the previous submission, and remains 35 nsf less than the SD submission.

*Vocations and Technology*

Total NSF of 3,150 sf remains unchanged from the previous submission and remains 20 nsf less than the SD submission.

*Health and Physical Education*

Total NSF of 9,765 sf remains unchanged from the previous submission and remains 220 nsf less than the SD submission.

*Media Center*

Total NSF has gone down from SD by 195 sf due to adjustments to the cohort commons, which resulted in a reduction of 165 nsf from the previous submission.

*Dining and Food Service*

Total NSF of 8,840 sf remains unchanged from the previous submission, and remains 120 nsf less than the SD submission.

*Medical*

Total NSF of 610 sf has gone down from the previous submission by 10 sf, and is unchanged from the SD submission.

*Administration and Guidance*
Total NSF of 5,235 sf remains unchanged from the previous submission, and remains 15 nsf less than the SD submission.

*Custodial and Maintenance*
Total NSF of 610 sf has gone down from the previous submission by 10 sf due to a reduction in the outdoor equipment storage, and is 405 nsf more than the SD submission.

*Other*
Total NSF has increased by 75 nsf from the previous submission due to an increase in the size of the auditorium storage and the dressing rooms, which are now closer in size to the approved SD figures. The overall size of 6,705 nsf is 5 sf larger than SD.

## 3.3 Project Approvals

### 3.3.1 Approval Status

Approval status is as follows

*1. DESE - Special Education approval by Department of Elementary and Secondary Education.*

- APPROVED. Please see attached signed approval dated 9/27/18 also included in CD-60% submission.

*2. MHC - Project Notification Form and approvals by MA Historical Commission.*

- APPROVED. Please see attached signed approval dated 1/2/18 also included in CD-60% submission.

*3. OIG - Construction Manager at Risk approval by the Office of Inspector General*

- APPROVED. Please see signed approval dated 12/21/18 included in CD-60% submission.

*4. Executive Office of Energy and Environmental Affairs / EEA*

- Not Applicable

*5. MA DEP - Massachusetts Department of Environmental Protection*

- Remediation of contaminated soil is complete (both arsenic in peat and underground storage tanks). Final closure reports for UST to be filed in October 2019. RAM completion report in regard to arsenic in soil to be issued November 2019.

*6. MA DOT - Massachusetts Department of Transportation*

- Not Applicable

*7. MA DPH - Massachusetts Department of Public Health*

- Not Applicable

*8. EPA –NPDES National Pollutant Discharge Elimination System Notice of Intent approval by the US Environmental Protection Agency*

- Please see application certified by CMR on 6/10/19 included in CD-60% submission.

*9. MAAB - Accessibility variances by MA Architectural Access Board*

- Not Applicable. No accessibility variances are anticipated.

*10. Framingham Zoning Board of Appeals.*

- Variance for height approved Please see signed approval dated 5/15/18 included in CD-60% submission.

*11. Framingham Planning Board.*

- APPROVED. Please see documentation included in CD-60% submission.

12. *Framingham Conservation Commission.*
    - APPROVED. Please see Order of Conditions dated 7/1/19 included in CD-60% submission.

13. *Framingham Building Department*
    - Permit received to perform sitework and geotechnical ground improvements
    - Stamped Building Permit application filed after approval of GMP for Structural Package, October 2019
    - Supplemental Permit application to be filed after approval of GMP, January 2020
    -

14. *Framingham Fire Department.*
    - Permit application to be filed after approval of GMP, January 2020

15. *Framingham Board of Health.*
    - Permit application for kitchen to be filed after approval of GMP, January 2020
    - RAM plan (see #5 above)

16. *Framingham Department of Public Works*
    - Framingham DPW (includes water and sewer utilities) reviewed project as part of the successful Planning Board Approval. See flow test letter dated 11/2/18 and letter from Framingham DPW dated 4/30/19 included in CD-60% submission.

17. *Framingham Utilities*
    - Please see correspondence with Eversource confirming adequate supply of Natural Gas and Electrical / Cable work orders included in section 3.3.3 Utility Certifications.

# Massachusetts Department of Elementary and Secondary Education

75 Pleasant Street, Malden, Massachusetts 02148-4906

Telephone: (781) 338-3000
TTY: N.E.T. Relay 1-800-439-2370

Jeffrey C. Riley
*Commissioner*


September 27, 2018

Mary Pichetti
Director of Capital Planning
Massachusetts School Building Authority
40 Broad Street, Suite 500
Boston, MA 02109

Dear Ms. Pichetti:

We have reviewed the space summary and accompanying documentation submitted by the Framingham Public Schools for a construction project at the Fuller Middle School. We have done so in accordance with M.G.L. chapter 70B, section 6(6), which instructs us to certify "…that adequate provisions have been made in the school project for children with disabilities, as defined in section 1 of chapter 71B…".

We are satisfied with the district's proposed floor plans and believe that their special education plan will provide the community with an opportunity to serve its special education students well. We accompany this approval with a suggestion that one pair of special education rooms on the second floor be relocated to the third floor in order to more equitably distribute that programming, though we submit that there may be good programmatic reasons to have all of those rooms on the second floor.

The Massachusetts Department of Elementary and Secondary Education therefore certifies that this school project has been planned to adequately provide appropriate space to serve the programs and school populations referenced in M.G.L. chapter 70B, section 6(6) noted above.

Sincerely,

Matthew J. Deninger
DESE designee on the MSBA Board of Directors

Cc: Vani Rastogi-Kelly, Director, Public School Monitoring, ESE
Amy Paulin, Supervisor, Public School Monitoring, ESE
Katie DeCristofaro, Capital Program Manager, MSBA

Allison Jones, Project Coordinator, MSBA
Fenton Bradley, Project Manager, MSBA

# The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

January 2, 2018

Phillip Gray
266 Beacon Street
Boston, MA 02116

RE: Fuller Middle School, 31 Flagg Drive, Framingham, MA; MHC# RC.63588

Dear Mr. Gray:

The Massachusetts Historical Commission (MHC) is in receipt of a Project Notification Form (PNF) for the project referenced above, received at this office on December 7, 2017. The staff of the MHC have reviewed the information submitted and have the following comments.

The proposed project consists of three options for the existing Kennedy Middle School at 31 Flagg Drive in Framingham. The options include either the renovation of the existing school building, partial demolition and construction of an addition, or full demolition of the existing school and construction of a new school on the site. The information provided indicates that the project will use funding from the Massachusetts School Building Authority

Review of MHC's files indicates that the Fuller Middle School is not included in MHC's Inventory of Historic and Archaeological Assets of the Commonwealth, nor listed in the National and State Registers of Historic Places. No further review by the MHC is required for the MSBA-funded project.

These comments are offered to assist in compliance with Massachusetts General Laws, Chapter 9, Sections 26-27C, as amended by Chapter 254 of the Acts of 1988 (950 CMR 71.00). Please do not hesitate to contact me if you have any questions.

Sincerely,

Linda Santoro
Preservation Planner
Massachusetts Historical Commission

xc: MSBA

220 Morrissey Boulevard, Boston, Massachusetts 02125
(617) 727-8470 • Fax: (617) 727-5128
www.sec.state.ma.us/mhc

### 3.3.2 Approval Letter

Attached is a letter of Approval from Framingham Public Schools.

# Framingham Public Schools

**Robert A. Tremblay, Ed.D., Superintendent of Schools**

73 Mount Wayte Avenue, Suite #5
Framingham, Massachusetts 01702
Telephone: 508-626-9118 Fax: 508-877-4240


August 9, 2019

Mr. Brian Lynch
Project Coordinator
Massachusetts School Building Authority
40 Broad Street, Suite 500
Boston, Massachusetts 02109

**Re: New Fuller Middle School** **Framingham, Massachusetts**

*60% Construction Documents Submission to the MSBA*

Dear Brian,

In accordance with Article 4.12 of the executed Project Funding Agreement, dated March 1, 2019, this letter shall confirm that approval from the Massachusetts Historical Commission was received on January 2, 2018, approval from the Secretary of Environmental Affairs is not applicable as no ENF or EIR is required for the project, and approval from the Massachusetts Architectural Access Board is not applicable as no variances are being sought for the project.

Very truly yours,

Robert Tremblay, Ed.D
Superintendent of Schools

### 3.3.3 Utility Certifications

Attached are Utility Certifications including loading of the following:

- Gas Load Letter - Eversource 10/8/19
- Electrical Load Letter - Eversource 10/10/19

AKAL Engineering Inc.

Date: 10/8/2019

Eversource Energy
157 Cordaville Road
Southborough, MA 01772

Attn: Ms. Margie McDonald
Strategic Account Executive

Reference: Gas Load Letter for New Fuller Middle School, Framingham, MA.

Dear Margie,

As discussed earlier, please find updated gas load information of the above-referenced facility at 31 Flagg Dr., Framingham. The project is scheduled to go into construction by early next year. The project scope includes construction of a new school. The existing gas service at the existing school will remain be active until the new building is occupied.

Summary of gas load requirement of the facility is as below:

| Gas Equipment | Gas Load (MBH) |
|---|---|
| (2) Boilers | (2) @ 4,000 = 8,000 MBH |
| (2) Domestic Water Heaters | (2) @ 400 = 800 MBH |
| Kitchen appliances | = 1,450 MBH |
| Science Room | = 30 MBH |
| Emergency Generator | =3,100 MBH |
| Sub Total | 13,380 MBH |

**Total Building Load: 10,280 CFH**
**Outdoor generator gas load 3,100 CFH**

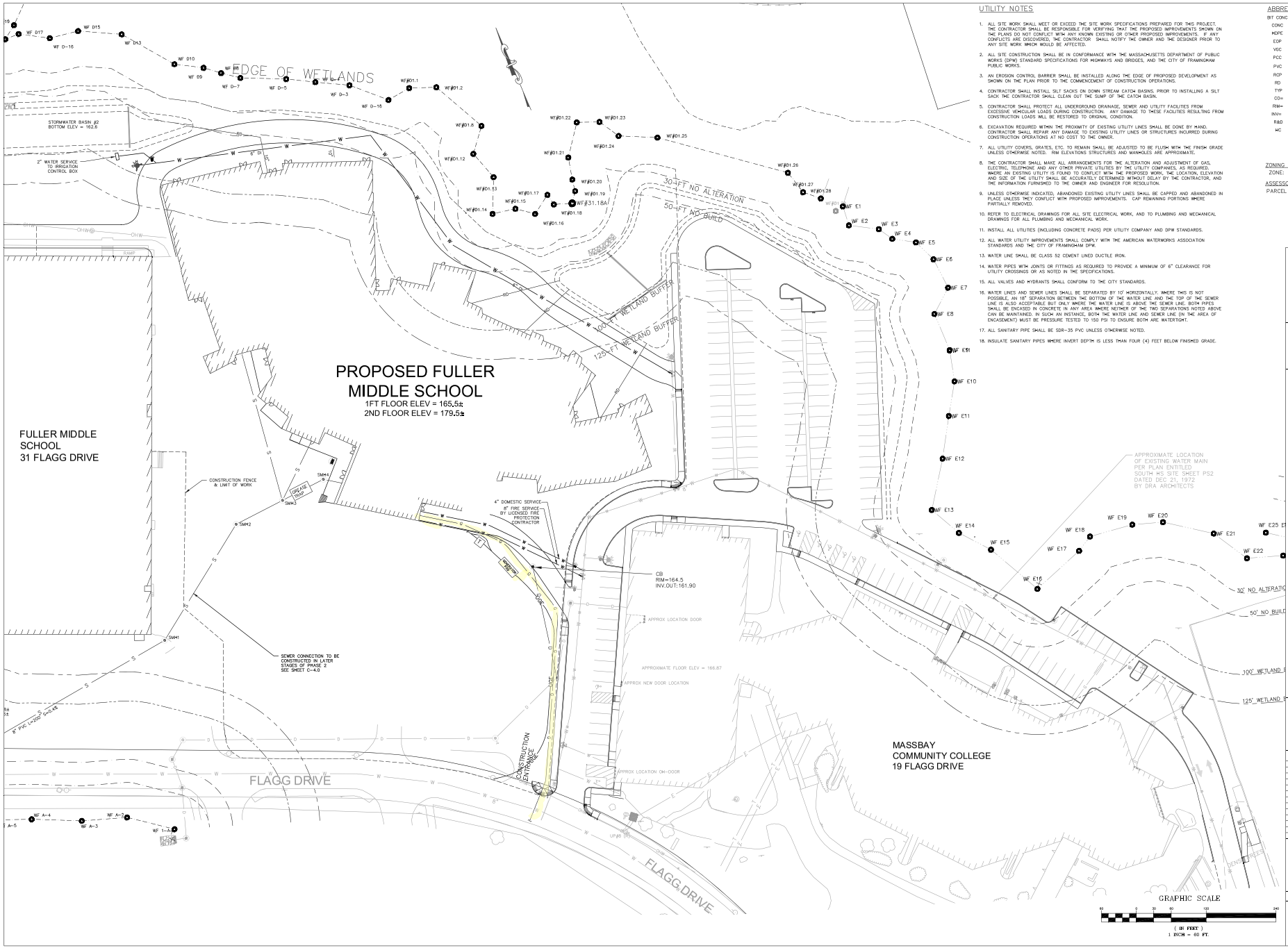
The gas pressure requirement for the building gas load is in the range of 7 -11" of W.C. and for a dedicated gas line to the emergency generator require 11" W.C.

The site utility plan is attached for the location of a new meter. Let me know if you need any additional information.

Regards

Anup S Khatra P.E
AKAL Engineering Inc.

44 Central Street, Unit 4, Berlin, MA 01503
Phone: (508)869-0403 : Fax (508)869-2891
Email: ask@akalengineering.com : Web: www.akalengineering.com




## UTILITY NOTES

1. ALL SITE WORK SHALL MEET OR EXCEED THE SITE WORK SPECIFICATIONS PREPARED FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF ANY CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE DESIGNER PRIOR TO ANY SITE WORK WHICH WOULD BE AFFECTED.
2. ALL SITE CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS (DPW) STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, AND THE CITY OF FRAMINGHAM PUBLIC WORKS.
3. AN EROSION CONTROL BARRIER SHALL BE INSTALLED ALONG THE EDGE OF PROPOSED DEVELOPMENT AS SHOWN ON THE PLAN PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OPERATIONS.
4. CONTRACTOR SHALL INSTALL SILT SACKS ON DOWN STREAM CATCH BASINS. PRIOR TO INSTALLING A SILT SACK THE CONTRACTOR SHALL CLEAN OUT THE SUMP OF THE CATCH BASIN.
5. CONTRACTOR SHALL PROTECT ALL UNDERGROUND DRAINAGE, SEWER AND UTILITY FACILITIES FROM EXCESSIVE VEHICULAR LOADS DURING CONSTRUCTION. ANY DAMAGE TO THESE FACILITIES RESULTING FROM CONSTRUCTION LOADS WILL BE RESTORED TO ORIGINAL CONDITION.
6. EXCAVATION REQUIRED WITHIN THE PROXIMITY OF EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE OWNER.
7. ALL UTILITY COVERS, GRATES, ETC. TO REMAIN SHALL BE ADJUSTED TO BE FLUSH WITH THE FINISH GRADE UNLESS OTHERWISE NOTED. RIM ELEVATIONS STRUCTURES AND MANHOLES ARE APPROXIMATE.
8. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES, AS REQUIRED. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER AND ENGINEER FOR RESOLUTION.
9. UNLESS OTHERWISE INDICATED, ABANDONED EXISTING UTILITY LINES SHALL BE CAPPED AND ABANDONED IN PLACE UNLESS THEY CONFLICT WITH PROPOSED IMPROVEMENTS. CAP REMAINING PORTIONS WHERE PARTIALLY REMOVED.
10. REFER TO ELECTRICAL DRAWINGS FOR ALL SITE ELECTRICAL WORK, AND TO PLUMBING AND MECHANICAL DRAWINGS FOR ALL PLUMBING AND MECHANICAL WORK.
11. INSTALL ALL UTILITIES (INCLUDING CONCRETE PADS) PER UTILITY COMPANY AND DPW STANDARDS.
12. ALL WATER UTILITY IMPROVEMENTS SHALL COMPLY WITH THE AMERICAN WATERWORKS ASSOCIATION STANDARDS AND THE CITY OF FRAMINGHAM DPW.
13. WATER LINE SHALL BE CLASS 52 CEMENT LINED DUCTILE IRON.
14. WATER PIPES WITH JOINTS OR FITTINGS AS REQUIRED TO PROVIDE A MINIMUM OF 6" CLEARANCE FOR UTILITY CROSSINGS OR AS NOTED IN THE SPECIFICATIONS.
15. ALL VALVES AND HYDRANTS SHALL CONFORM TO THE CITY STANDARDS.
16. WATER LINES AND SEWER LINES SHALL BE SEPARATED BY 10' HORIZONTALLY. WHERE THIS IS NOT POSSIBLE, AN 18" SEPARATION BETWEEN THE BOTTOM OF THE WATER LINE AND THE TOP OF THE SEWER LINE IS ALSO ACCEPTABLE BUT ONLY WHERE THE WATER LINE IS ABOVE THE SEWER LINE. BOTH PIPES SHALL BE ENCASED IN CONCRETE IN ANY AREA WHERE NEITHER OF THE TWO SEPARATIONS NOTED ABOVE CAN BE MAINTAINED. IN SUCH AN INSTANCE, BOTH THE WATER LINE AND SEWER LINE (IN THE AREA OF ENCASEMENT) MUST BE PRESSURE TESTED TO 150 PSI TO ENSURE BOTH ARE WATERTIGHT.
17. ALL SANITARY PIPE SHALL BE SDR-35 PVC UNLESS OTHERWISE NOTED.
18. INSULATE SANITARY PIPES WHERE INVERT DEPTH IS LESS THAN FOUR (4) FEET BELOW FINISHED GRADE.

## ABBREVIATIONS

| | |
|---|---|
| BIT CONC | BITUMINOUS CONCRETE |
| CONC | CONCRETE |
| HDPE | HIGH-DENSITY POLYETHYLENE |
| EOP | EDGE OF PAVEMENT |
| VGC | VERTICAL GRANITE CURB |
| PCC | PRECAST CONCRETE CURB |
| PVC | POLYVINYL CHLORIDE |
| RCP | REINFORCED CONCRETE PIPE |
| RD | ROOF DRAIN |
| TYP | TYPICAL |
| CO= | CLEAN OUT |
| RIM= | RIM ELEVATION |
| INV= | INVERT ELEVATION |
| R&D | REMOVE AND DEMOLISH |
| HC | HANDICAP RAMP |

## ZONING REQUIREMENTS

ZONE: R-1 SINGLE RESIDENCE

## ASSESSORS MAP

PARCEL ID: 102-82-8137-000
102-92-5235-000
102-82-4579-000
102-82-2420-000
102-92-2532-000
112-91-8848-000
112-91-7530-000
112-91-1567-000
112-91-2435-000


Jonathan Levi Architects
266 beacon street
boston ma 02116
tel 617 437 9458
fax 617 437 1965

CDW CONSULTANTS, INC.
CIVIL & ENVIRONMENTAL ENGINEERS
6 HURON DRIVE
NATICK, MA 01760
TEL (508) 875-2677 FAX (508) 875-6017
www.cdwconsultants.com


# FULLER MIDDLE SCHOOL

31 FLAGG DRIVE, FRAMINGHAM, MA

PROJECT STATUS

EARLY CONCRETE & STEEL PACKAGE
8/9/2019

REVISIONS

| No. | Date | Description |
|---|---|---|

DRAWING NAME

**PHASE 2: UTILITY PLAN**

PROJECT NO. 1722

DRAWING NO.

C-2.3

**GARCIA • GALUSKA • DESOUSA**
Consulting Engineers Inc.

370 Faunce Corner Road, Dartmouth, MA 02747-1217

L#65302r
J#680 015 00.00

February 13, 2019, *Revised May 3, 2019, Revised October 10, 2019*

Eversource
247 Station Drive, SW 340
Westwood, MA 02090

Attn: Bryan Rooney

RE: Fuller Middle School
Flagg Drive
Framingham MA

Dear Mr. Rooney,

The City of Framingham will be constructing a new Middle School consisting of 136,790 SF located on the same site adjacent to the existing Middle School. The existing Middle School at 31 Flagg Drive will remain occupied during the construction phase and will then be demolished once the new school is complete. Construction will be phased.

The new incoming primary service will run underground between an onsite utility pole and the new transformer pad. The transformer will be a padmount located in the vicinity as shown on the Site Plan. We are proposing one new service to feed the Middle School. The existing Middle School primary service, pad mounted transformer and secondary service will be removed at the end of the construction phase.

We anticipate secondary metering with the C/Ts located in the switchboard C/T section. The transformer will be supplied by the Utility Company.

Attached are copies of our proposed Electrical Site Plan, Site Details, and Power Riser Diagram. Please review and send back with your comments.

The job will be going out to bid in May 2019. Construction will start in June 2019. The Facility will be complete in July 2021.

In addition, we request that you send us the following information:

1. Available short circuit duty at the secondary of the transformer.

2. Anticipated transformer size and impedance.

3. Transformer pad installation requirements.

4. Primary line installation details and the work to be performed by the contractor.

5. Requirements for reduced voltage starting.

6. Metering rate schedule.

7. Metering requirements, including location and hot or cold sequence installation.

8. Anticipated back charges.

Our projected breakdown of loads are as follows:

A. HVAC:

| **HVAC Units** | | | Electric Rating | | **KVA** |
|---|---|---|---|---|---|
| RTU - 1 | | @ | 70 Tons | = | 105.0 |
| RTU - 2 | | @ | 70 Tons | = | 105.0 |
| RTU - 3 | | @ | 70 Tons | = | 105.0 |
| RTU - 4 | | @ | 70 Tons | = | 105.0 |
| RTU - 5 | | @ | 21 Tons | = | 31.0 |
| RTU - 6 | | @ | 40 Tons | = | 60.0 |
| RTU - 7 | | @ | 40 Tons | = | 60.0 |
| RTU - 8 | | @ | 14 Tons | = | 21.0 |
| | | | **RTU Sub-Total** | **=** | **592.5** |
| | | | | | |
| | | | | | |
| CH-1 | | @ | 175 Tons (258 amps) | = | 214.4 |
| CH-2 | | @ | 175 Tons (258 amps) | = | 214.4 |
| | | | **Chiller Sub-Total** | **=** | **428.8** |
| | | | | | |
| MAU-1 | | @ | 10 HP | = | 12.0 |
| P-1 | | @ | 25 HP | = | 27.0 |
| P-2 (standby) | | @ | 25 HP | = | -0- |
| P-3 | | @ | 25 HP | = | 27.0 |
| P-4 (standby) | | @ | 25 HP | = | -0- |
| SEF-1 & SEF-2 | 2 | @ | 50 HP | = | 104.0 |
| SEF-3 & SEF-4 | 2 | @ | 50 HP | = | 104.0 |
| UH's | 43 | @ | 1/5 HP | = | 25.8 |
| KEF-1 | | @ | 3 HP | = | 3.3 |
| KEF-2 | | @ | 2 HP | = | 2.2 |
| EF's | 12 | @ | ½ HP | = | 10.8 |
| EUH-1, 2 & 3 | 3 | @ | 5 KW | = | 15.0 |
| Condensate Pumps | 15 | @ | 70 W | = | 1.1 |
| Stand alone DCU's | 11 | @ | 2 Tons | = | 33.0 |
| B-1, 2, 3 | 3 | @ | 8 Amps | = | 2.9 |
| | | | **Misc. Sub-total** | **=** | **350.1** |
| | | | **HVAC Total** | **=** | **1,371.4** |

B. Plumbing/Fire Protection:

| | | | | | KVA |
|---|---|---|---|---|---|
| Domestic Water Booster Pumps | 2 | @ | 5 HP | = | 12.0 |
| Water Coolers | 5 | @ | ¼ HP | = | 2.5 |
| Circulator Pumps | 3 | @ | 1/3 HP | = | 2.7 |
| | | | Sub-total | = | 17.2 KVA |

C. Elevator:

| | | | | | |
|---|---|---|---|---|---|
| | 1 | @ | 40 HP | = | 42.0 |

D. Exterior Lighting:

| | | | | | |
|---|---|---|---|---|---|
| | | | | | 10.0 |

E. Interior Lighting:

| | | | | |
|---|---|---|---|---|
| | 136,790 S.F @ | 1.0 W/S.F. | = | 136.8 KVA |

F. General Power:

| | | | | |
|---|---|---|---|---|
| | 136,790 S.F @ | 2.0 W/S.F. | = | 273.6 KVA |

G. Kitchen Dishwasher/Booster Heater 20.0
Other Equipment 75.0
**Subtotal = 95.0**

H. Theatrical Lighting 90.0

| | | |
|---|---|---|
| A. | = | 1,371.4 |
| B. | = | 17.2 |
| C. | = | 42.0 |
| D. | = | 10.0 |
| E. | = | 136.8 |
| F. | = | 273.6 |
| G | = | 95.0 |
| H | = | 90.0 |
| **Total** | **=** | **2,036.0** |

2,036.0 kVA @ 277/480V, 3 phase, 4 wire = 2,450.0 Amps

A standard 2,500 Ampere, 277/480V, 3 phase, and 4 wire service was selected. The main breaker will be 100% rated.

Secondary Service will consist of (6) sets of 4 #600 KCM copper in (6) 4” conduits plus (1) 4” spare.

We intend to participate in the incentive programs that you are offering. This facility will be a LEED School. Please provide a contact so that we may schedule a meeting.

We would like to schedule a site meeting with you at your earliest convenience to coordinate the incoming service. Please contact this office with your availability.

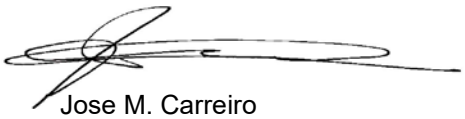
The facility will have an emergency stand-by 300 KW natural gas generator.

The facility will have provisions for a roof mounted grid connected photovoltaic system.

Please contact our office should you require anything further regarding this matter.

Sincerely,

**GARCIA · GALUSKA · DESOUSA**
Consulting Engineers Inc.



Jose M. Carreiro

JMC:jfm

Enc.

Cc: Philip Gray, Jonathan Levi Architects
Carol Harris, Jonathan Levi Architects
Carlos G. DeSousa, P.E., Garcia, Galuska & DeSousa, Inc.
Mark Bibby, Garcia, Galuska & DeSousa, Inc.

## Appendices

1 Energy Calculations

2 Life Cycle Cost Analysis

3 Heat Gain and Loss Calculations HVAC

4 Draft Cost Estimates

## Appendix

## Appendix

2 Life Cycle Cost Analysis

- Water Use Reduction Life Cycle Analysis
- Mechanical System Lifecycle Engineering Economic Analysis

## Appendix

## Appendix

4 Draft CostEstimate

- Draft Estimate Comparison
- CMR draft estimate
- Designer draft estimate
- OPM draft estimate and comparison analysis

## Appendices

1 Energy Calculations

2 Life Cycle Cost Analysis

3 Heat Gain and Loss Calculations HVAC

4 Draft Cost Estimates

## Appendix

# MSBA Design Development Submission
# LEED Energy Savings Analysis
# For
# Fuller Middle School

## Framingham, MA

**October 11, 2019**
**(90% Construction Documents Update)**

Prepared for:

Fuller Middle School

Prepared by:

Garcia, Galuska & DeSousa
Consulting Engineers, Inc.

GARCIA • GALUSKA • DESOUSA
Consulting Engineers Inc.

370 Faunce Corner Road, Dartmouth, MA 02747-1217

# Fuller Middle School – 90% Construction Documents LEED Energy Savings Analysis

## Section 1.0: Executive Summary

A mechanical lifecycle engineering economic analysis was performed to assess the performance of various mechanical systems in comparison to a baseline mechanical system to determine the most cost effective system for the project. The results of the report concluded that a variable air volume (VAV) mixed-air full air-conditioning displacement ventilation system was the most cost effective system studied with an instant payback and an approximate $1,891,411 savings over the 30 year study period. The design system is as follows:

- Multiple low wall-mounted displacement diffusers at approximately 600-800 CFM (1 per classroom) each for each classroom and support area
- Multiple low wall-mounted displacement diffusers located throughout the administration, cafeteria, and media center areas
- Multiple low wall-mounted fully air-conditioned displacement diffusers located throughout the auditorium/stage and gymnasium areas
- Variable air volume boxes with demand ventilation control and temperature sensor to modulate airflow based on occupancy and space heating/cooling demand for each zone
- Dedicated overhead galvanized ventilation distribution system feeding each displacement diffuser
- Hot water radiant heating located along exterior walls
- Variable air volume hot water coil heating/chilled water coil cooling rooftop air handling units with demand control ventilation and static plate energy recovery providing fully air conditioned displacement ventilation to the terminal variable air volume boxes serving the administration, classroom, cafeteria, and media center areas
- Variable air volume hot water coil heating/chilled water coil cooling rooftop air handling units with static plate energy recovery and demand control ventilation providing mixed-air overhead distribution to the auditorium/stage, and gymnasium areas
- Variable air volume 100% outside air tempered hot water coil heating/chilled water coil cooling rooftop air handling units with static plate energy recovery and terminal variable air volume boxes serving the locker room areas
- Chilled water cooling/hot water coil rooftop make-up air handling unit and variable air volume exhaust air fan system serving the kitchen
- Limited use of hot water radiant heating and unit heaters
- (2) 4,000 MBH input high-efficiency gas-fired condensing boilers hot water heating plant
- 369.6 ton high-efficiency air-cooled chiller plant

- Four-pipe heating/cooling piping system serving air handling units
- Two-pipe hot water distribution system serving radiant heating panels and unit heaters
- Chilled and hot water primary pumping with variable frequency drives
- Direct digital controls throughout

To confirm that the design building meets the MSBA requirements of 16% energy cost savings for LEED V4 EAc1 – Optimize Energy Performance, updated energy model simulations have been performed comparing the design building in comparison to a baseline ASHRAE Standard 90.1-2010 building. The design building simulation has been updated to reflect the system capacities as indicated in the design development documents.

Section 1.0: LEED Building Systems Description

1. The ASHRAE Standard 90.1-2010 baseline building is as follows:

- Envelope:
  - Wall: R-13 + R-7.5 c.i.
  - Roof: R-20 c.i.
  - Underslab: R-10 perimeter
  - Curtainwall: 0.45 U-Value, 0.40 SHGC
- Mechanical System:
  - Hot water coil heating/chilled water coil cooling VAV AHU systems with energy recovery wheels serving terminal VAV boxes with hot water reheat coils
  - (2) 82% efficient gas-fired hot water boilers
  - (2) 0.68 kW/ton high-efficiency water-cooled chillers with associated cooling tower
- Domestic Hot Water System:
  - 80% efficient gas-fired domestic hot water system
- Lighting System:
  - 0.99 w/s.f.

2. The design building is as follows:

- Envelope:
  - Walls: R-13 c.i.
  - Roof: R-36 c.i.
  - Underslab: R-10 perimeter
  - Curtainwall: 0.38 U-Value, 0.38 SHGC (N) / 0.29 SHGC (S,E,W)
- Mechanical System:
  - (As outlined above)
- Domestic Hot Water System:
  - 94% efficient gas-fired domestic hot water system
- Lighting System:
  - 0.50 w/s.f.

Section 1.2: LEED Energy Savings Analysis Conclusion

A comparison of the Design Building against the ASHRAE Standard 90.1-2010 Baseline Building results in a projected energy cost savings of 34.6% exceeding the MSBA required 16% energy cost savings and resulting in 13 points for LEED V4 EAc2 – Optimize Energy Performance.

Note:

The values indicated above are based on energy modelling performed for system comparison purposes only. Our office strongly recommends adding a 30% safety factor to the calculated values of this report for budgeting purposes to account for potential variances to the actual operation of the building. Per ASHRAE Standard 90.1-2010:

*Neither the proposed building performance nor the baseline building performance are predictions of actual energy consumption or costs for the proposed design after construction. Actual experience will differ from these calculations due to variations such as occupancy, building operation and maintenance, weather, energy use not covered by this procedure, changes in energy rates between design of the building and occupancy, and the precision of the calculation tool.*

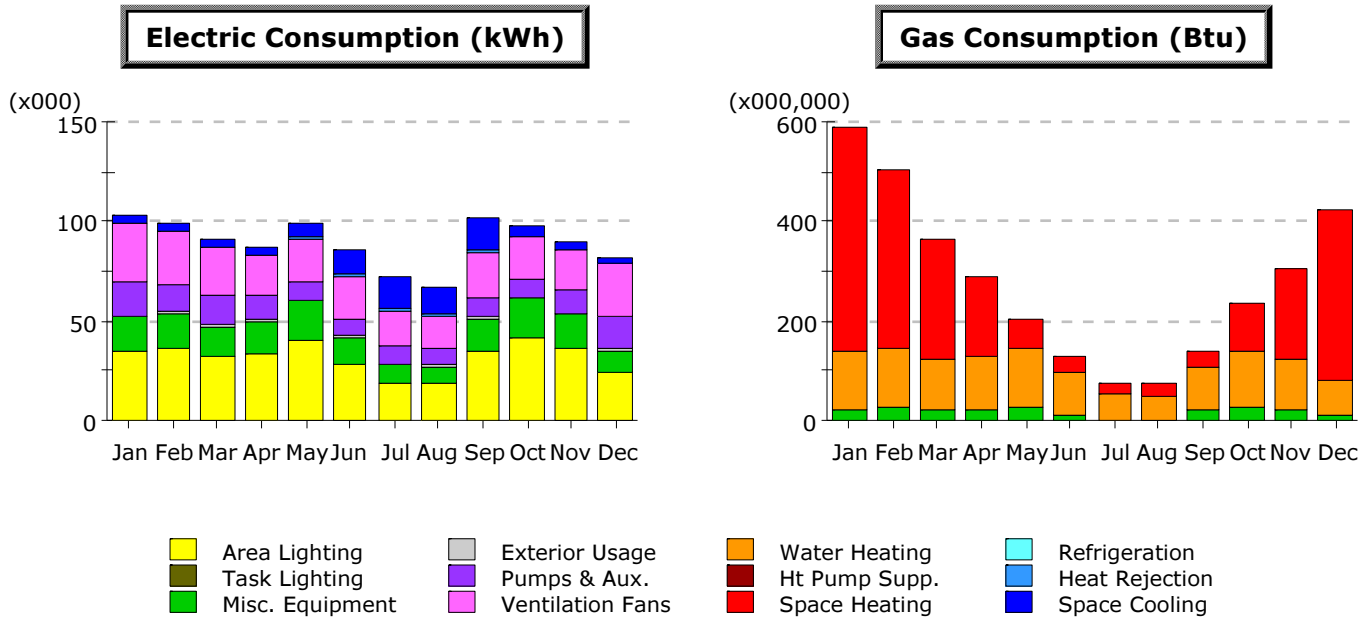
GARCIA • GALUSKA • DESOUSA
Consulting Engineers Inc.
370 Faunce Corner Road, Dartmouth, MA 02747-1217

## Fuller Middle School - LEED Energy Savings Summary
## (90% Construction Documents Update)

| Baseline | System | Annual Elec. Cons. (kWh) | Annual Gas Cons. (MBTU) | Annual Electric Cost | Annual Gas Cost | Combined Utility Cost | Annual Utility $/s.f. | Annual kBTU/s.f. (EUI) | Combined Expense Savings* | Energy Cost Savings Percentage | LEED EAc2 Points |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LEED Baseline | 1. ASHRAE Standard 90.1-2010 Envelope (Wall Insulation R-13 + R-7.5 c.i., Roof Insulation R-20 c.i., Windows 0.55 U-Value/0.40 SHGC, Curtainwall 0.45 U-Value/0.40 SHGC)<br>2. ASHRAE Standard 90.1-2010 Mechanical Systems (System 7 - Packaged VAV w/ Reheat with 0.68 kW/ton Water-Cooled Chillers and 82% Eff. Hot Water Boilers)<br>3. ASHRAE Standard 90.1-2010 Lighting System (0.99 w/s.f.)<br>4. ASHRAE Standard 90.1-2010 Domestic Hot Water Systems (82% Eff. Hot Water Heaters) | 1,075,200 | 3,340.5 | $197,738 | $24,710 | $222,448 | $1.48 | 46.73 | - | - | - |

| Option | System | Annual Elec. Cons. (kWh) | Annual Gas Cons. (MBTU) | Annual Electric Cost | Annual Gas Cost | Combined Utility Cost | Annual Utility $/s.f. | Annual kBTU/s.f. (EUI) | Combined Expense Savings* | Energy Cost Savings Percentage | LEED EAc2 Points |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Design Building | 1. Design Envelope (Wall Insulation R-12 c.i., Pre-Engineered Walls: R-22 c.i., Roof Insulation R-36 c.i., Windows 0.45 U-Value/0.39 SHGC, Curtainwall 0.38 U-Value/0.39 SHGC)<br>2. Design Mechanical Systems (VAV Full AC Displacement Ventilation Static Plate ERV Systems and 1.05 High-Efficiency kW/ton Air-Cooled Chillers and 94% High-Efficiency Condensing Boilers)<br>3. Design High-Efficiency Lighting System (0.5 w/s.f.)<br>4. Design High-Efficiency Domestic Hot Water Systems (94% Eff. Hot Water Heaters) | 668,090 | 3,048.4 | $122,861 | $22,549 | $145,410 | $0.97 | 35.52 | $77,038 | **34.6%** | **13** |

*Combined expense savings is the difference between the combined annual expense of the baseline and building in comparison.




**Electric Consumption (kWh x000)**

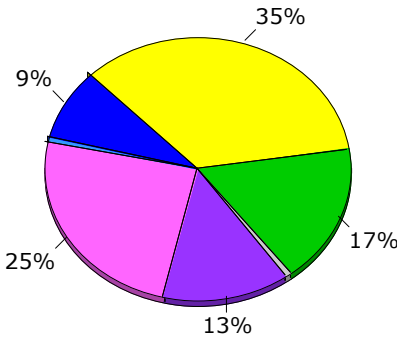
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 4.2 | 3.8 | 3.9 | 4.4 | 7.6 | 12.0 | 16.4 | 13.5 | 15.5 | 5.8 | 4.1 | 3.7 | 94.9 |
| Heat Reject. | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 1.0 | 1.3 | 1.2 | 1.1 | 0.2 | 0.0 | 0.0 | 5.3 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 30.3 | 26.1 | 23.8 | 20.0 | 21.8 | 20.9 | 17.7 | 15.8 | 23.5 | 20.6 | 19.0 | 26.6 | 266.2 |
| Pumps & Aux. | 16.8 | 14.6 | 15.4 | 12.1 | 9.4 | 8.9 | 8.5 | 8.3 | 9.3 | 9.9 | 12.5 | 16.1 | 141.9 |
| Ext. Usage | 0.8 | 0.6 | 0.7 | 0.6 | 0.5 | 0.4 | 0.5 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 7.8 |
| Misc. Equip. | 16.8 | 17.5 | 14.8 | 16.0 | 19.4 | 13.6 | 8.8 | 8.6 | 16.6 | 20.0 | 17.1 | 10.7 | 179.7 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 35.0 | 36.2 | 32.1 | 33.9 | 40.4 | 28.5 | 19.1 | 18.5 | 34.5 | 41.0 | 35.9 | 24.3 | 379.4 |
| **Total** | 103.8 | 98.8 | 90.7 | 87.1 | 99.6 | 85.3 | 72.3 | 66.7 | 101.1 | 98.3 | 89.4 | 82.2 | 1,075.2 |

**Gas Consumption (Btu x000,000)**

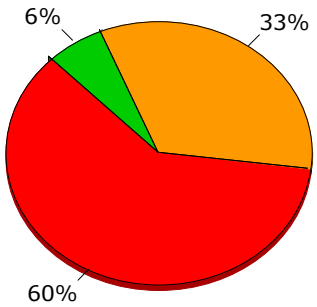
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 451.4 | 358.7 | 246.2 | 158.5 | 58.6 | 32.9 | 23.5 | 25.2 | 34.0 | 98.4 | 184.7 | 342.4 | 2,014.5 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 113.9 | 120.4 | 101.2 | 108.7 | 119.7 | 81.2 | 53.0 | 49.2 | 86.8 | 108.1 | 98.1 | 69.8 | 1,110.0 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 23.4 | 24.7 | 19.5 | 22.1 | 27.3 | 13.0 | 0.1 | 0.1 | 20.8 | 28.5 | 23.4 | 13.1 | 216.0 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 588.7 | 503.8 | 366.9 | 289.3 | 205.5 | 127.2 | 76.6 | 74.5 | 141.5 | 235.0 | 306.1 | 425.3 | 3,340.5 |

**Annual Energy Consumption by Enduse**

| | Electricity kWh (x000) | Natural Gas MBtu | Steam Btu | Chilled Water Btu |
|---|---|---|---|---|
| Space Cool | 94.9 | - | - | - |
| Heat Reject. | 5.3 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | - | 2,014.5 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 1,110.0 | - | - |
| Vent. Fans | 266.2 | - | - | - |
| Pumps & Aux. | 141.9 | - | - | - |
| Ext. Usage | 7.8 | - | - | - |
| Misc. Equip. | 179.7 | 216.0 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 379.4 | - | - | - |
| **Total** | 1,075.2 | 3,340.5 | - | - |

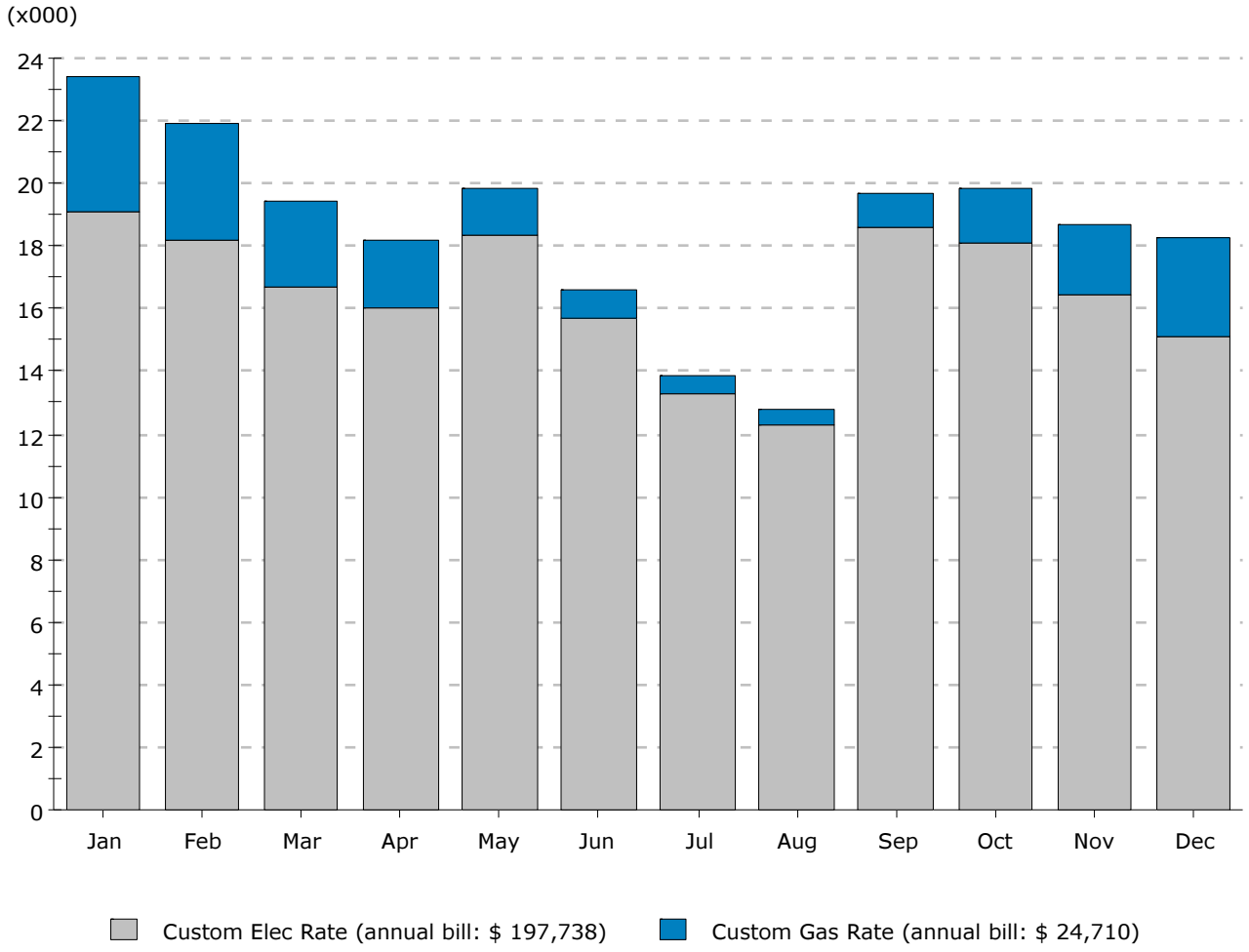




**Electricity**

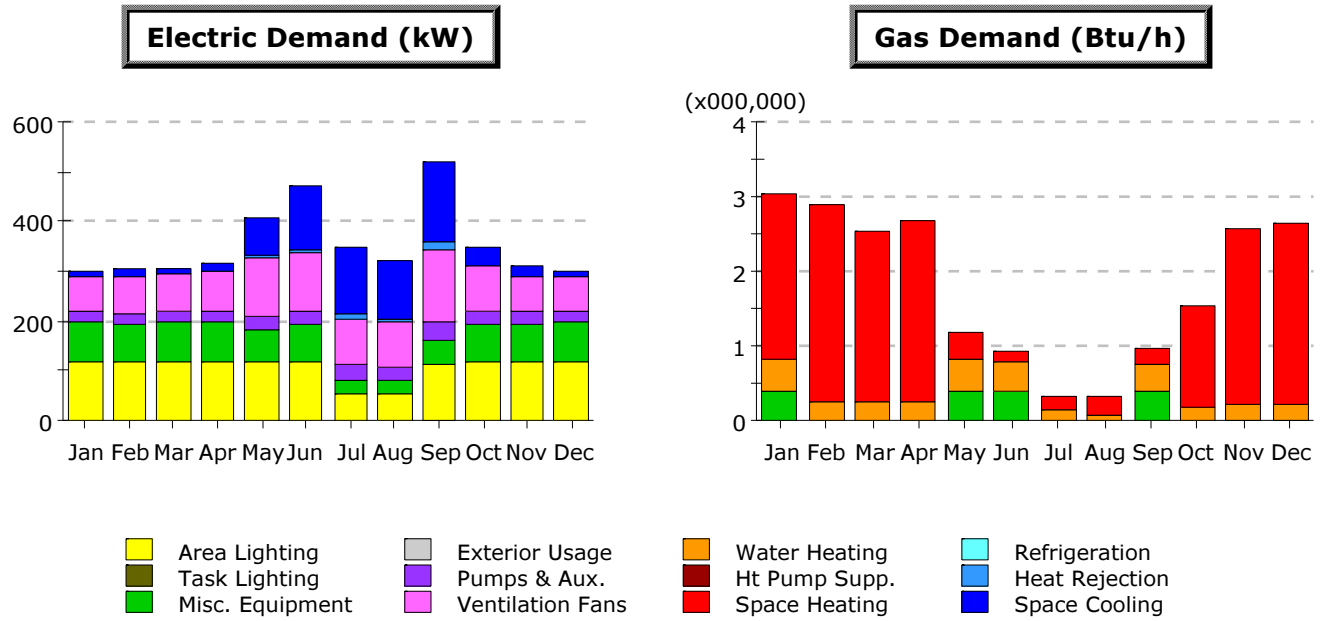



**Natural Gas**

## Monthly Utility Bills ($)




**Total Annual Bill Across All Rates: $ 222,448**




**Electric Demand (kW)**

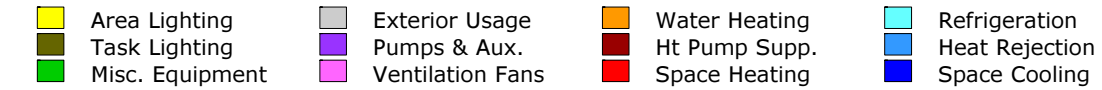
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 9.5 | 14.1 | 13.0 | 15.4 | 75.3 | 126.4 | 131.8 | 119.9 | 161.6 | 36.6 | 20.8 | 8.2 | 732.6 |
| Heat Reject. | - | - | - | 0.5 | 4.8 | 4.8 | 12.7 | 4.8 | 12.1 | 3.1 | 1.3 | - | 44.1 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 68.7 | 73.8 | 72.5 | 80.1 | 117.8 | 118.7 | 93.5 | 91.4 | 148.5 | 92.2 | 68.6 | 69.6 | 1,095.4 |
| Pumps & Aux. | 23.7 | 23.9 | 23.8 | 23.6 | 25.6 | 26.1 | 31.0 | 27.1 | 33.4 | 24.0 | 23.8 | 23.7 | 309.7 |
| Ext. Usage | - | - | - | - | - | - | - | 0.4 | 0.4 | - | - | - | 0.7 |
| Misc. Equip. | 80.8 | 73.8 | 80.8 | 80.8 | 64.4 | 77.8 | 24.0 | 24.3 | 49.7 | 76.8 | 77.8 | 80.8 | 791.8 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 117.3 | 117.3 | 117.3 | 117.3 | 117.3 | 117.3 | 55.6 | 53.8 | 112.9 | 117.3 | 117.3 | 117.3 | 1,277.8 |
| **Total** | 300.0 | 302.9 | 307.3 | 317.6 | 405.2 | 471.2 | 348.6 | 321.6 | 518.5 | 350.0 | 309.6 | 299.7 | 4,252.2 |

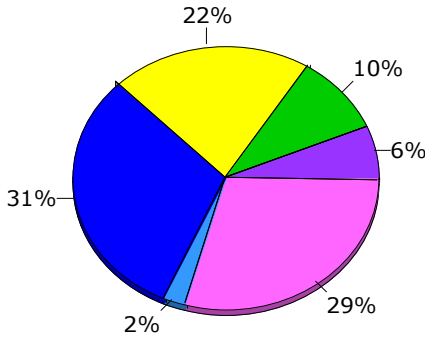
**Gas Demand (Btu/h x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 2.19 | 2.64 | 2.30 | 2.44 | 0.38 | 0.16 | 0.19 | 0.26 | 0.22 | 1.35 | 2.36 | 2.44 | 16.93 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 0.46 | 0.24 | 0.24 | 0.23 | 0.43 | 0.40 | 0.15 | 0.06 | 0.36 | 0.19 | 0.20 | 0.22 | 3.18 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0.38 | 0.00 | 0.00 | 0.00 | 0.38 | 0.38 | - | - | 0.38 | 0.00 | 0.00 | 0.00 | 1.54 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 3.03 | 2.88 | 2.54 | 2.68 | 1.20 | 0.94 | 0.34 | 0.33 | 0.96 | 1.54 | 2.56 | 2.66 | 21.65 |

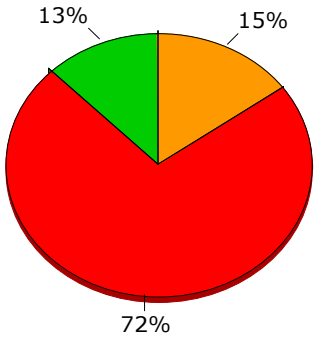
**Annual Peak Demand by Enduse**

| | Electricity kW | Natural Gas Btu/h (x000) | Steam Btu/h | Chilled Water Btu/h |
|---|---|---|---|---|
| Space Cool | 161.56 | - | - | - |
| Heat Reject. | 12.10 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | - | 2,186.6 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 459.7 | - | - |
| Vent. Fans | 148.49 | - | - | - |
| Pumps & Aux. | 33.44 | - | - | - |
| Ext. Usage | 0.37 | - | - | - |
| Misc. Equip. | 49.72 | 379.5 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 112.86 | - | - | - |
| **Total** | 518.53 | 3,025.7 | - | - |

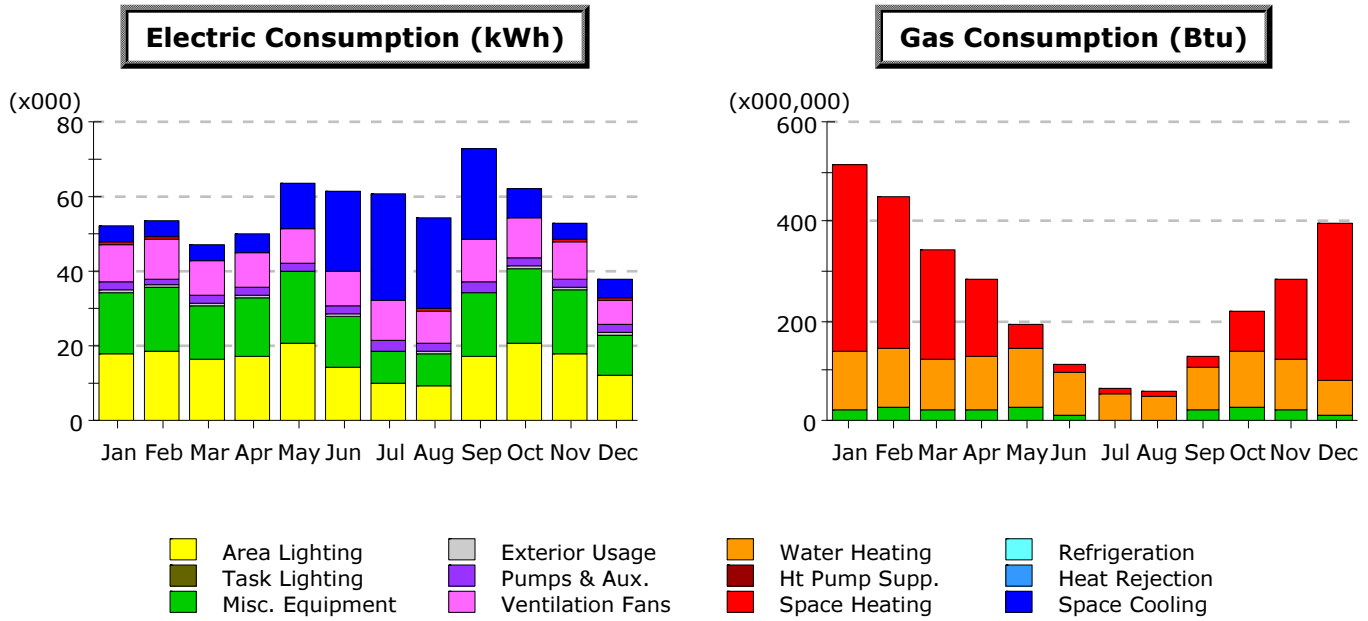



**Electricity**




**Natural Gas**




**Electric Consumption (kWh x000)**

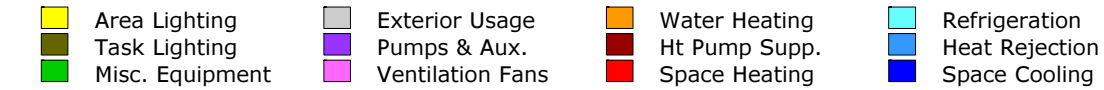
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 4.08 | 3.94 | 4.22 | 4.98 | 12.22 | 21.53 | 28.61 | 24.50 | 24.62 | 7.77 | 4.88 | 4.90 | 146.24 |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 0.58 | 0.48 | 0.43 | 0.34 | 0.14 | 0.07 | 0.04 | 0.04 | 0.07 | 0.21 | 0.30 | 0.52 | 3.22 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 10.01 | 10.64 | 8.95 | 9.23 | 8.76 | 9.14 | 10.60 | 8.57 | 11.14 | 10.84 | 10.14 | 6.70 | 114.71 |
| Pumps & Aux. | 2.10 | 1.93 | 2.02 | 1.97 | 2.10 | 2.30 | 2.58 | 2.46 | 2.48 | 2.06 | 1.96 | 2.14 | 26.09 |
| Ext. Usage | 0.66 | 0.51 | 0.56 | 0.54 | 0.39 | 0.38 | 0.39 | 0.63 | 0.61 | 0.63 | 0.64 | 0.66 | 6.60 |
| Misc. Equip. | 16.76 | 17.46 | 14.78 | 15.98 | 19.43 | 13.57 | 8.82 | 8.63 | 16.59 | 19.96 | 17.08 | 10.66 | 179.72 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 17.65 | 18.26 | 16.21 | 17.09 | 20.41 | 14.38 | 9.66 | 9.32 | 17.40 | 20.72 | 18.13 | 12.27 | 191.51 |
| **Total** | 51.85 | 53.22 | 47.16 | 50.14 | 63.43 | 61.36 | 60.70 | 54.15 | 72.92 | 62.19 | 53.13 | 37.85 | 668.09 |

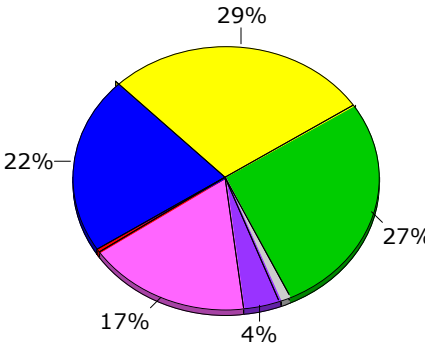
**Gas Consumption (Btu x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 376.2 | 302.2 | 220.5 | 151.9 | 47.8 | 20.1 | 11.3 | 10.9 | 22.5 | 83.3 | 159.5 | 313.3 | 1,719.6 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 114.0 | 120.6 | 101.4 | 109.0 | 120.0 | 81.5 | 53.1 | 49.4 | 87.1 | 108.4 | 98.4 | 69.9 | 1,112.8 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 23.4 | 24.7 | 19.5 | 22.1 | 27.3 | 13.0 | 0.1 | 0.1 | 20.8 | 28.5 | 23.4 | 13.1 | 216.0 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 513.6 | 447.5 | 341.4 | 282.9 | 195.1 | 114.7 | 64.6 | 60.3 | 130.4 | 220.3 | 281.3 | 396.3 | 3,048.4 |

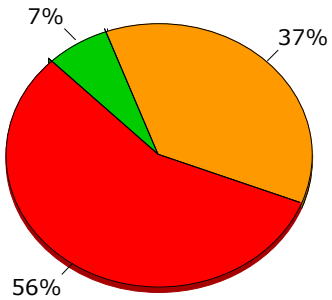
**Annual Energy Consumption by Enduse**

| | Electricity kWh (x000) | Natural Gas MBtu | Steam Btu | Chilled Water Btu |
|---|---|---|---|---|
| Space Cool | 146.24 | - | - | - |
| Heat Reject. | - | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 3.22 | 1,719.6 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 1,112.8 | - | - |
| Vent. Fans | 114.71 | - | - | - |
| Pumps & Aux. | 26.09 | - | - | - |
| Ext. Usage | 6.60 | - | - | - |
| Misc. Equip. | 179.72 | 216.0 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 191.51 | - | - | - |
| **Total** | 668.09 | 3,048.4 | - | - |



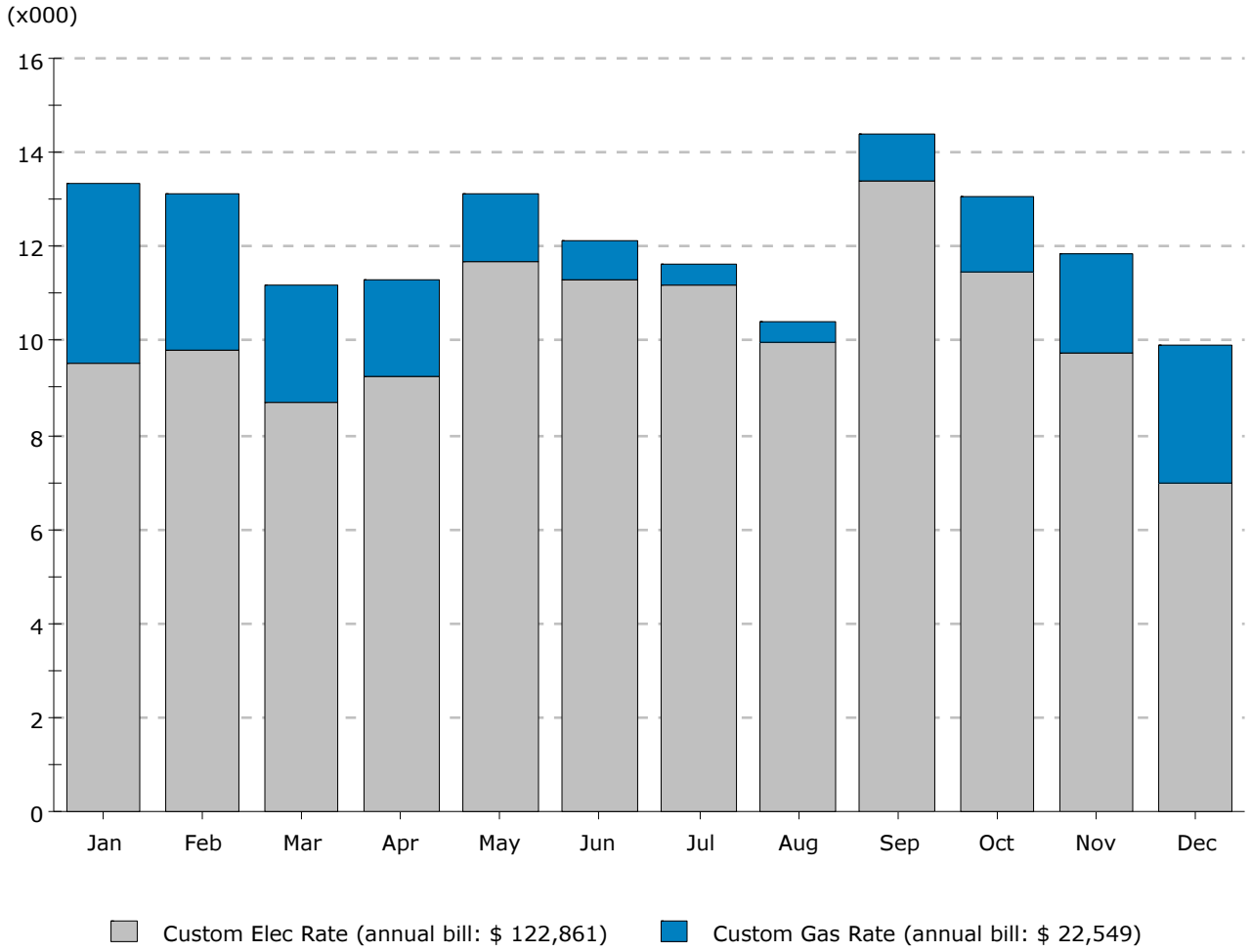




**Electricity**

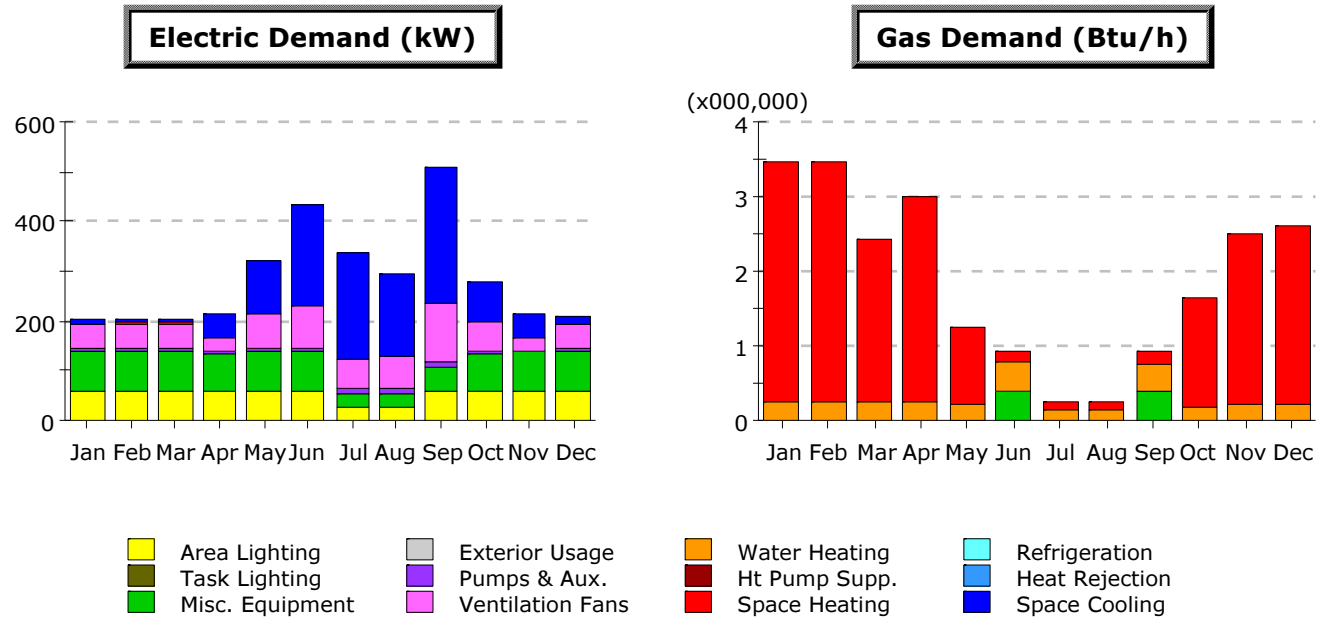



**Natural Gas**

## Monthly Utility Bills ($)




**Total Annual Bill Across All Rates: $ 145,410**




**Electric Demand (kW)**

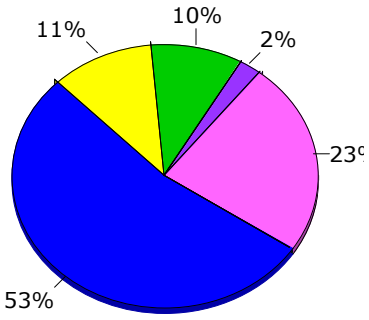
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 10.1 | 10.1 | 10.1 | 52.9 | 109.5 | 203.0 | 211.0 | 163.0 | 270.2 | 81.8 | 52.0 | 15.5 | 1,189.3 |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 0.9 | 0.9 | 0.9 | 0.5 | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.4 | 0.5 | 0.9 | 6.1 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 49.8 | 51.2 | 51.4 | 23.3 | 69.9 | 86.2 | 63.2 | 66.9 | 118.3 | 56.6 | 22.8 | 48.3 | 707.9 |
| Pumps & Aux. | 3.9 | 3.8 | 3.8 | 4.2 | 6.2 | 9.1 | 9.6 | 9.6 | 12.6 | 5.5 | 4.2 | 3.9 | 76.5 |
| Ext. Usage | - | - | - | - | - | - | - | 0.3 | 0.3 | - | - | - | 0.6 |
| Misc. Equip. | 80.8 | 80.8 | 80.8 | 76.8 | 77.8 | 77.8 | 24.0 | 24.3 | 49.7 | 76.8 | 77.8 | 80.8 | 808.2 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 28.1 | 29.1 | 57.0 | 59.2 | 59.2 | 59.2 | 647.0 |
| **Total** | 204.9 | 206.1 | 206.2 | 216.9 | 322.8 | 435.7 | 336.2 | 293.4 | 508.3 | 280.2 | 216.4 | 208.6 | 3,435.5 |

**Gas Demand (Btu/h x000,000)**

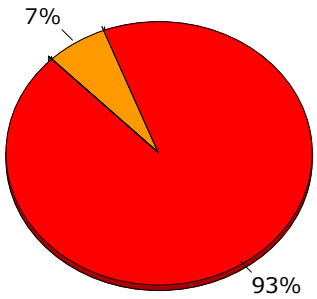
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 3.22 | 3.20 | 2.18 | 2.76 | 1.04 | 0.13 | 0.10 | 0.11 | 0.20 | 1.46 | 2.31 | 2.39 | 19.10 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 0.23 | 0.24 | 0.24 | 0.23 | 0.22 | 0.40 | 0.15 | 0.14 | 0.36 | 0.19 | 0.20 | 0.22 | 2.82 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | - | - | 0.38 | 0.00 | 0.00 | 0.00 | 0.79 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 3.46 | 3.45 | 2.42 | 3.00 | 1.26 | 0.91 | 0.26 | 0.25 | 0.94 | 1.65 | 2.51 | 2.61 | 22.71 |

**Annual Peak Demand by Enduse**

| | Electricity kW | Natural Gas Btu/h (x000) | Steam Btu/h | Chilled Water Btu/h |
|---|---|---|---|---|
| Space Cool | 270.23 | - | - | - |
| Heat Reject. | - | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 0.20 | 3,224.5 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 231.4 | - | - |
| Vent. Fans | 118.27 | - | - | - |
| Pumps & Aux. | 12.61 | - | - | - |
| Ext. Usage | 0.31 | - | - | - |
| Misc. Equip. | 49.72 | 3.8 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 56.97 | - | - | - |
| **Total** | 508.30 | 3,459.7 | - | - |


**Electricity**




**Natural Gas**

## Appendix

2 Life Cycle Cost Analysis

- Water Use Reduction Life Cycle Analysis
- Mechanical System Lifecycle Engineering Economic Analysis

AKAL Engineering Inc.

# Water Use Reduction Life Cycle Analysis

# for

# Fuller Middle School

# Framingham, MA

**October 18, 2019**

Prepared for:

Fuller Middle School

Prepared by:

**AKAL Engineering Inc**

AKAL Engineering Inc.

**Water Use Reduction Summary** **October 18, 2019**

The Fuller Middle School will utilize high water efficiency equipment in order to minimize water consumption and reduce the burden on the aquifer and well water supply. The plumbing fixtures selected for the project are intended to reduce water consumption by greater than 30% beyond a typical code required design.

High efficiency fixtures specified for the project include the following:

- High-efficiency water closets equipped with 1.28 gallon per flush flushometers in lieu of code required 1.6 gallon per flush.
- High-efficiency urinals equipped with 0.125 gallon per flush flushometers in lieu of code required 1.0 gallon per flush urinal.
- Metering lavatory faucets with 0.35 GPM aerators in lieu of code required 0.5 GPM.
- General sinks equipped with 0.5 gallon per minute restricting faucets.
- Showers equipped with 1.5 GPM shower head in lieu of 2.5 GPM.

The attached spreadsheet will quantify the water use reduction expected. The spreadsheet calculates the baseline (code required) water use and the design water use. The approximate annual water savings is 335,043 gallons of water with a simple payback of less than 1 year for the high efficiency plumbing fixtures.

AKAL Engineering Inc.

## Indoor Portable Water Use Reduction

Calculation for potable water use is performed through low flow water fixtures and compared with the base case required by code.

| | |
|---|---|
| (F) Employees = | 55 |
| (M) Employees = | 55 |
| (F) Students = | 450 |
| (M) Students = | 450 |
| Actual Occupancy = | 1010 |

**LEED- Water Efficiency**

**BASE CASE (248 CMR Plumbing Code )**

**PROJECT : FULLER MIDDLE SCHOOL, MA**

**Credit 4- Water use Reduction**

**Baseline Indoor Water Consumption Calculation**

| Fixture Type | Flow-rate | Rate | Duration | | Occupants | Daily Uses | Water Use |
|---|---|---|---|---|---|---|---|
| Conventional Toilet -Staff | 1.6 | gpf | 1 | flush | 110 | 3 | 528 |
| Conventional Toilet (Male Student | 1.6 | gpf | 1 | flush | 450 | 1 | 720 |
| Conventional Urinals (Male) | 1 | gpf | 1 | flush | 450 | 2 | 900 |
| Conventional Toilet (Female Stude | 1.6 | gpf | 1 | flush | 450 | 3 | 2160 |
| Lavatory (per MA code) | 0.5 | gal/min | 0.5 | min. | 1010 | 3 | 758 |
| Class Room Sinks | 2.5 | gal.min | 0.25 | min. | 110 | 1 | 68.75 |
| Shower | 2.5 | gpm | 15 | min. | 11 | 1 | 413 |
| Hand sink-kitchen | 2.2 | gal/min | 15 | min. | 4 | 1 | 132 |
| Wash Down Spryer | 1.5 | gal/min | 15 | min. | 1 | 1 | 22.5 |
| Clothes Washer | 40 | gal/load | 1 | load | 1 | 4 | 160 |
| | | | | | | | |
| | | | | | | | |
| | | | | Total Daily Volume | | | 5861 |
| | | | | Number of School Days | | | 180 |
| | | | | | | | |
| | | | | Design Total Annual Volume (gal) | | | 1,055,025.00 |

AKAL Engineering Inc.

**DESIGNED**

**PROJECT : FULLER MIDDLE SCHOOL, MA**

**Credit 4 Water use Reduction**

## Design Indoor Water Consumption Calculation

| Fixture Type | Flow-rate | Rate | Duration | Unit | Occupants | Daily Uses | Water Use |
|---|---|---|---|---|---|---|---|
| Conventional Toilet -Staff | 1.28 | gpf | 1 | flush | 110 | 3 | 422.4 |
| L ow flow Flush Toilet (Male Studen | 1.28 | gpf | 1 | flush | 450 | 1 | 576 |
| Urinals (ultra low flow)-Male stude | 0.125 | gpf | 1 | flush | 450 | 2 | 112.5 |
| Low Flow Flush Toilet (Female Stud | 1.28 | gpf | 1 | flush | 450 | 3 | 1728 |
| Lavatory (low flow hand free) | 0.5 | gal/min | 0.5 | min | 1010 | 3 | 757.5 |
| Class Room Sink s | 1.5 | gal/min | 0.25 | min | 110 | 2 | 82.5 |
| Shower | 2.5 | gpm | 15 | min. | 11 | 1 | 413 |
| Hand Sink- Kitchen | 1.2 | gal/min | 15 | min | 4 | 1 | 72 |
| Wash Down -Sprayer | 0.67 | gal/min | 15 | min. | 1 | 1 | 10.05 |
| Efficient Clothes Washer | 20 | gal/load | 1 | load | 1 | 4 | 80 |
| | | | | | | | |
| | | | | Total Daily Volume | | | 3831.05 |
| | | | | Number of School Days | | | 180 |
| | | | | Design Total Annual Volume (gal) | | | 689,589.00 |

## Credit Water Efficiency-Credit for water use reduction.

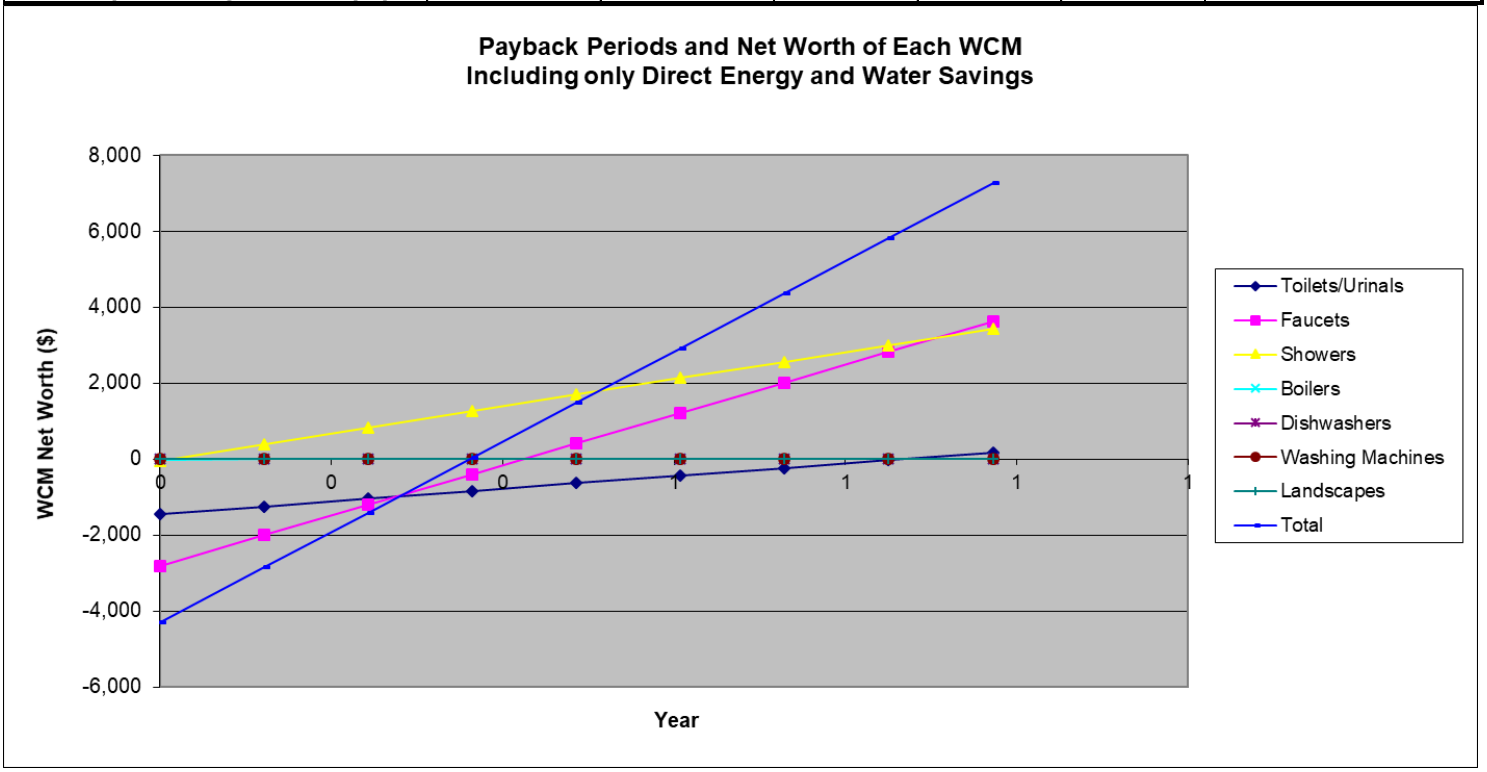
| Design | Annual Water Consumption (gal) | Annual Water Saving (gal) | % of water Reduction |
|---|---|---|---|
| **Designed** | **689,589.00** | **365,436.00** | **34.64%** |
| **Baseline** | **1,055,025.00** | - | - |

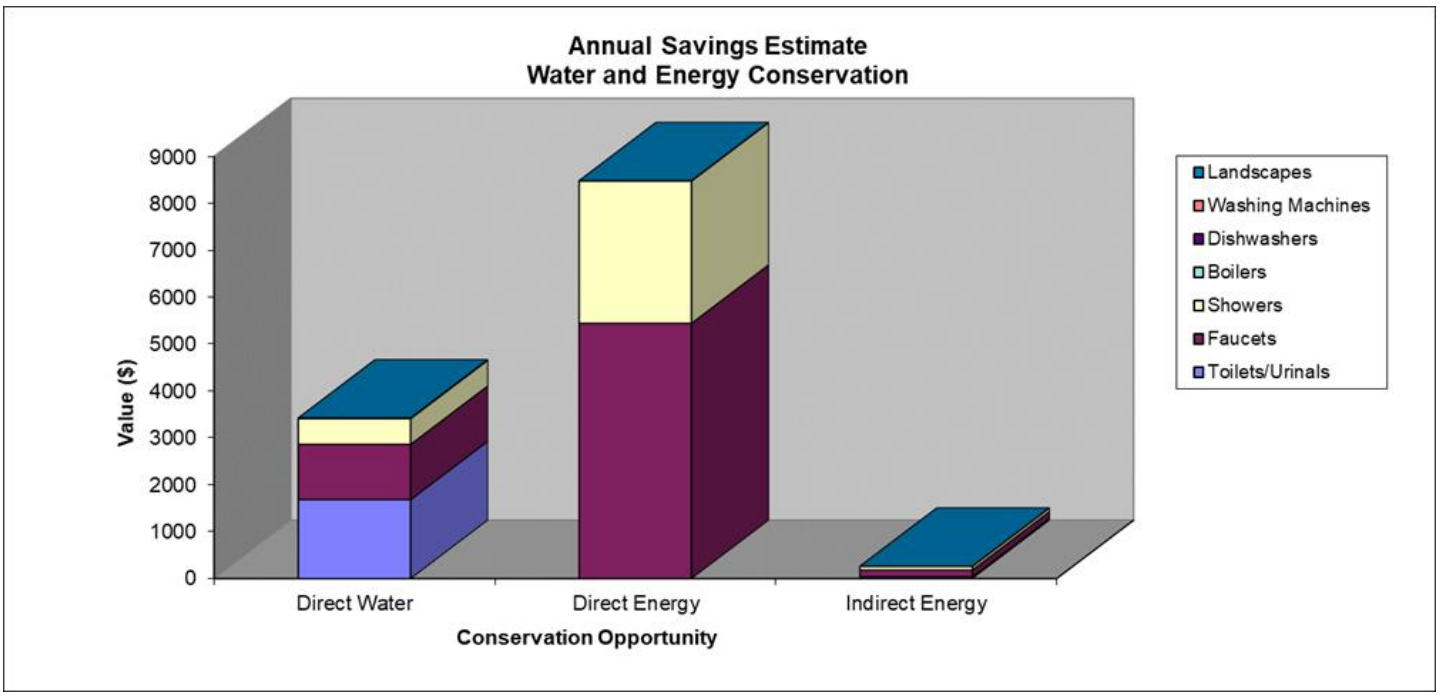
Total annual water saving will be 365,435 gallon or 48,855 cubic feet water and sewer saving. Cost saving can be calculated based on the town of Framingham Water Department.

AKAL Engineering Inc.

# Water Conservation & LCCA

| Conservation Method | Number of Installations | Total Initial Cost ($) | Annual Savings ($) | | | Payback Period* (yrs) *Includes Direct Energy Only |
|---|---|---|---|---|---|---|
| | | | Direct Water | Direct Energy | Indirect Energy | |
| Installation of ULF toilets and ULF urinals | 72 | $6,500 | $7,828 | $0 | $90 | 0.83 |
| Installation of automatic faucets | 83 | $6,480 | $6,445 | $1,856 | $376 | 0.78 |
| Installation of faucet aerators | 83 | $2,200 | $1,463 | $4,800 | $85 | 0.35 |
| Low Flow showerhead | 1 | $140 | $256 | $5,800 | $78 | 0.02 |
| Boiler blowdown optimization | 0 | $0 | $0 | $0 | $0 | 0.00 |
| Efficient dishwashers | 2 | $150 | $4,000 | $3,500 | $791 | 0.02 |
| Efficient washing machines | 1 | $300 | $11,688 | $4,034 | $791 | 0.02 |
| Landscape irrigation optimization | #N/A | $6 | $12 | $0 | $0 | Annual |
| **Total (excluding Landscape)** | | **$15,770** | **$31,680** | **$19,990** | **$2,211** | **0.31** |




Annual Savings Estimate
Water and Energy Conservation
Value ($)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Direct Water
Direct Energy
Indirect Energy
Conservation Opportunity
Landscapes
Washing Machines
Dishwashers
Boilers
Showers
Faucets
Toilets/Urinals

# Engineering Economic Analysis
# for
# Fuller Middle School

## Framingham, MA

**May 3, 2019**
**75% Design Documents**

Prepared for:

Fuller Middle School

Prepared by:

Garcia, Galuska & DeSousa
Consulting Engineers, Inc.

# Fuller Middle School Engineering Economic Analysis

## Table of Contents

# EXECUTIVE SUMMARY

## Section 1.0: Executive Summary

The Fuller Middle School is a new four-story school with an approximate gross area of 150,000 s.f. The building has been simulated with the school's anticipated hours of operation including evening and summer programming.

The goal of the mechanical system lifecycle engineering economic analysis is to assess the performance of various mechanical systems in comparison to a baseline mechanical system.

Each option is compared to the baseline system to determine the lowest combined savings over a 30 year cycle to determine the most advantageous system considering anticipated hours of operation, electrical costs, gas costs, maintenance costs, and initial construction costs.

The conditioned spaces of the building are simulated to maintain indoor air temperature conditions of 70ºF DB for heating and 75°F DB with 55% RH for cooling for all options. Unoccupied temperature setback of 60°F DB heating and 85ºF DB cooling is provided for all options.

By comparison of each option to the baseline system, the option with the greatest total life-cycle savings is generally recommended. To further enhance controllability and overall system performance, additional options should be considered that will enhance year round temperature control and comfort at a possible marginal increase in capital cost.

Upon completion of the mechanical system lifecycle engineering economic analysis, the design building is simulated with the recommended mechanical system in comparison to an ASHRAE Standard 90.1-2010 baseline building to project the anticipated energy cost percentage savings for LEED V4 EAc2 – Optimize Energy Performance.

## Section 1.1: Mechanical System Analysis

### 1.1.A: Baseline Mechanical System – ASHRAE/IECC Baseline Variable Air Volume Systems

- Hot water coil heating/chilled water coil cooling rooftop air handling units with energy recovery wheels and terminal variable air volume boxes with hot water reheat coils serving the administration, classrooms, auditorium/stage, cafeteria, gymnasium, media center, and locker room areas
- Chilled water cooling/hot water coil rooftop make-up air handling unit and variable air volume exhaust air fan system serving the kitchen
- Overhead fiberglass insulated supply and return air ductwork distribution systems
- Limited use of radiant heating panels and unit heaters
- (4) 2,000 MBH code-efficient gas-fired boiler power plant
- (2) 175 ton code high-efficiency water-cooled chillers and cooling tower chilled water plant (350 ton total capacity)
- Four-pipe heating/cooling piping system serving air handling units

- Two-pipe hot water distribution system serving radiant heating panels, unit heaters, and variable air volume boxes with hot water reheat coils
- Chilled, condenser, and hot water primary pumping with variable frequency drives
- Direct digital controls throughout

1.1.B: Mechanical System Option One – High-Efficiency Variable Air Volume Systems

- Hot water coil heating/chilled water coil cooling rooftop air handling units with energy recovery wheels and terminal variable air volume boxes with hot water reheat coils serving the administration, classrooms, auditorium/stage, cafeteria, gymnasium, media center, and locker room areas
- Chilled water cooling/hot water coil rooftop make-up air handling unit and variable air volume exhaust air fan system serving the kitchen
- Overhead fiberglass insulated supply and return air ductwork distribution systems
- Limited use of radiant heating panels and unit heaters
- (4) 2,000 MBH high-efficiency gas-fired condensing boiler power plant
- (2) 175 ton high-efficiency water-cooled chillers and cooling tower chilled water plant (350 ton total capacity)
- Four-pipe heating/cooling piping system serving air handling units
- Two-pipe hot water distribution system serving radiant heating panels, unit heaters, and variable air volume boxes with hot water reheat coils
- Chilled, condenser, and hot water primary pumping with variable frequency drives
- Direct digital controls throughout

1.1.C: Mechanical System Option Two – Variable Air Volume Mixed-Air Full Air-Conditioning Displacement Systems

- Multiple low wall-mounted displacement diffusers at approximately 600-800 CFM (1 per classroom) each for each classroom and support area
- Multiple low wall-mounted displacement diffusers located throughout the administration, cafeteria, and media center areas
- Multiple low wall-mounted fully air-conditioned displacement diffusers located throughout the auditorium/stage and gymnasium areas
- Variable air volume boxes with demand ventilation control and temperature sensor to modulate airflow based on occupancy and space heating/cooling demand for each zone
- Dedicated overhead galvanized ventilation distribution system feeding each displacement diffuser

- Radiant heating panels located along exterior walls

- Variable air volume hot water coil heating/chilled water coil cooling rooftop air handling units with demand control ventilation and energy recovery wheels providing fully air conditioned displacement ventilation to the terminal variable air volume boxes serving the administration, auditorium/stage, classroom, cafeteria, gymnasium, and media center areas

- Chilled water cooling/hot water coil rooftop make-up air handling unit and variable air volume exhaust air fan system serving the kitchen

- Limited use of radiant heating panels and unit heaters

- (4) 2,000 MBH high-efficiency gas-fired condensing boiler power plant

- (2) 175 ton high-efficiency water-cooled chillers and cooling tower chilled water plant (350 ton total capacity)

- Four-pipe heating/cooling piping system serving air handling units

- Two-pipe hot water distribution system serving radiant heating panels and unit heaters

- Chilled, condenser, and hot water primary pumping with variable frequency drives

- Direct digital controls throughout

1.1.D: Mechanical System Option Two (a) – Variable Air Volume Mixed-Air Full Air-Conditioning Displacement Systems with Static Plate Energy Recovery

- This option is identical to Option 3 as outlined above but will utilize static plate energy recovery in each air handling unit rather than energy recovery wheels

1.1.E: Mechanical System Option Two (b) – Variable Air Volume Mixed-Air Full Air-Conditioning Displacement Systems with Static Plate Energy Recovery with Air-Cooled Chiller Plant

- This option is identical to Option 2b as outlined above but will utilize (2) 175 ton code high-efficiency air-cooled chillers (350 ton total capacity) rather than water-cooled chillers and the associated cooling tower

1.1.F: Mechanical System Option Three – Variable Air Volume Displacement Systems with Supplemental Passive Chilled Beam Air-Conditioning Units

- Multiple low wall-mounted displacement diffusers at approximately 450-600 CFM (1 per classroom) each for each classroom and support area

- Multiple low wall-mounted displacement diffusers located throughout the administration, cafeteria, and media center areas

- Radiant passive chilled beam cooling/heating panels providing full air-conditioning located throughout the classroom, administration, cafeteria, and media center areas

- Multiple low wall-mounted fully air-conditioned displacement diffusers located throughout the auditorium/stage and gymnasium areas

- Variable air volume boxes with demand ventilation control and temperature sensor to modulate airflow based on occupancy and space heating/cooling demand for each zone

- Dedicated overhead galvanized ventilation distribution system feeding each displacement diffuser

- Radiant heating panels located along exterior walls

- Variable air volume 100% outside air hot water coil heating/chilled water coil cooling rooftop air handling units with demand control ventilation and energy recovery wheels providing displacement ventilation to the terminal variable air volume boxes serving the classroom, cafeteria, and media center areas

- Variable air volume hot water coil heating/chilled water coil cooling rooftop air handling units with demand control ventilation and energy recovery wheels providing displacement ventilation to the terminal variable air volume boxes serving the gymnasium areas

- Variable air volume hot water coil heating/chilled water coil cooling rooftop air handling units with demand control ventilation and energy recovery wheels providing fully air conditioned displacement ventilation to the administration and auditorium/stage areas

- Chilled water cooling/hot water coil rooftop make-up air handling unit and variable air volume exhaust air fan system serving the kitchen

- Limited use of radiant heating panels and unit heaters

- (4) 2,000 MBH high-efficiency gas-fired condensing boiler power plant

- (2) 175 ton high-efficiency water-cooled chillers and cooling tower chilled water plant (350 ton total capacity)

- Four-pipe heating/cooling piping system serving air handling units and passive chilled beam units

- Two-pipe hot water distribution system serving radiant heating panels and unit heaters

- Chilled, condenser, and hot water primary pumping with variable frequency drives

- Direct digital controls throughout

1.1.G: Mechanical System Option Three (a) – Variable Air Volume Displacement Systems with Static Plate Energy Recovery and Supplemental Passive Chilled Beam Air-Conditioning Units

- This option is identical to Option 3 as outlined above but will utilize static plate energy recovery in each air handling unit rather than energy recovery wheels

1.1.H: Mechanical System Option Three (b) – Variable Air Volume Displacement Systems with Static Plate Energy Recovery and Supplemental Passive Chilled Beam Air-Conditioning Units with Air-Cooled Chiller Plant

- This option is identical to Option 3a as outlined above but will utilize (2) 175 ton code high-efficiency air-cooled chillers (350 ton total capacity) rather than water-cooled chillers and the associated cooling tower

1.1.I: Mechanical System Option Four – Geothermal Plant serving Variable Air Volume Mixed-Air Full Air-Conditioning Displacement Systems with Static Plate Energy Recovery

- Multiple low wall-mounted displacement diffusers at approximately 600-800 CFM (1 per classroom) each for each classroom and support area
- Multiple low wall-mounted displacement diffusers located throughout the administration, cafeteria, and media center areas
- Multiple low wall-mounted fully air-conditioned displacement diffusers located throughout the auditorium/stage and gymnasium areas
- Variable air volume boxes with demand ventilation control and temperature sensor to modulate airflow based on occupancy and space heating/cooling demand for each zone
- Dedicated overhead galvanized ventilation distribution system feeding each displacement diffuser
- Radiant heating panels located along exterior walls
- Variable air volume hot water coil heating/chilled water coil cooling rooftop air handling units with demand control ventilation and static plate energy recovery providing fully air conditioned displacement ventilation to the terminal variable air volume boxes serving the administration, auditorium/stage, classroom, cafeteria, gymnasium, and media center areas
- Chilled water cooling/hot water coil rooftop make-up air handling unit and variable air volume exhaust air fan system serving the kitchen
- Limited use of radiant heating panels and unit heaters
- (2) 2,000 MBH high-efficiency gas-fired condensing boiler power plant
- (140) 500' deep geothermal closed loop wells (350 tons total capacity)
- 350 ton total capacity high-efficiency water-to-water source geothermal modular heat pump chiller plant providing chilled and hot water throughout the building
- Four-pipe heating/cooling piping system serving air handling units
- Two-pipe hot water distribution system serving radiant heating panels and unit heaters
- Chilled, condenser, geothermal well, and hot water primary pumping with variable frequency drives
- Direct digital controls throughout

Section 1.2: Mechanical System Analysis Conclusion

The variable air volume air handling unit system is selected as the baseline system since it is an ASHRAE Standard 90.1/IECC baseline system that results in a low installed cost and relatively energy efficient system. Unfortunately, the selection results in overall ownership costs that in some cases are higher when compared to the alterative systems primarily relating to increased annual operating costs while potentially compromising the thermal comfort conditions of the building. The option comparison of each alternative system to the baseline assesses the benefits of improved systems with potentially reduced combined operating costs and improved thermal comfort with the goal of selecting the system with the highest ownership savings over the 30 year study period.

Annual electrical and gas consumption is calculated thru the results of a thermal dynamic heat transfer analysis utilizing Department of Energy (DOE-2)/eQuest software with all architectural data provided by Jonathan Levi Architects.

The building envelope reflects Jonathan Levi Architects' high-efficiency design. The roof has R-36 continuous insulation and the walls have R-12 continuous insulation. Windows have a U-Value of 0.24 and a SHGC of 0.39. The walls of the gymnasium and auditorium building are a pre-engineered metal sandwich panel assembly with an R-22 assembly rating.

Utility cost data for natural gas ($0.7397/therm) was obtained from utility bills of the existing school provided by the town. Utility cost data for electricity ($0.1839/kWh) was based from published average utility rates of the local utility providers.

The "Building Life-Cycle" analysis included future worth of each system option considered using standard industry discount, inflation, and interest rates.

Our observations of the Mechanical System Payback Summary suggest that Option 3b, Variable Air Volume Displacement Systems with Static Plate Energy Recovery and Supplemental Passive Chilled Beam Air-Conditioning Units with Air-Cooled Chiller Plant, represents the lowest life cycle by yielding an approximate $1,925,347 savings over the 30 year study period with an instant payback as it has a lower installed cost than the code baseline system.

Option 2b, Variable Air Volume Mixed-Air Full Air-Conditioning Displacement Systems with Static Plate Energy Recovery with Air-Cooled Chiller Plant, represents the second lowest life cycle cost by yielding an approximate $1,891,411 savings over the 30 year study period with an instant payback as it has a lower installed cost than the code baseline system. Due to the town's concerns with increased maintenance for the additional control valves and condensation considerations for the passive chilled beams of Option 3b's design, Option 2b is the recommended system for the project.

Section 2.0: LEED Energy Savings Summary

To confirm that the design building meets the MSBA requirements of 16% energy cost savings for LEED V4 EAc2 – Optimize Energy Performance, updated energy model simulations have been performed comparing the design building in comparison to a baseline ASHRAE Standard 90.1-2010 building.

1. The ASHRAE Standard 90.1-2010 baseline building is as follows:

- Envelope:
  - Wall: R-13 + R-7.5 c.i.
  - Roof: R-20 c.i.
  - Underslab: R-10 c.i.
  - Windows: 0.55 U-Value, 0.40 SHGC
  - Curtainwall: 0.45 U-Value, 0.40 SHGC
- Mechanical System:
  - Hot water coil heating/chilled water coil cooling VAV AHU systems with energy recovery wheels serving terminal VAV boxes with hot water reheat coils
  - (2) 82% efficient gas-fired hot water boilers
  - (2) 0.68 kW/ton high-efficiency water-cooled chillers with associated cooling tower
- Domestic Hot Water System:
  - 80% efficient gas-fired domestic hot water system
- Lighting System:
  - 0.99 w/s.f.

2. The design building with Mechanical System Option 3b is as follows:

- Envelope:
  - Walls: R-12 c.i.
  - Pre-Engineered Walls: R-22 c.i.
  - Roof: R-36 c.i.
  - Underslab: R-10 c.i.
  - Windows: 0.45 U-Value, 0.39 SHGC
  - Curtainwall: 0.38 U-Value, 0.39 SHGC
- Mechanical System:
  - Hot water coil heating/chilled water coil displacement ventilation AHU systems with static plate energy recovery serving terminal VAV boxes with demand ventilation controls (Mechanical System Option 2b)
  - (4) 94% efficient gas-fired hot water boilers
  - (2) 0.62 kW/ton high-efficiency water-cooled chillers with associated cooling tower
- Domestic Hot Water System:
  - 94% efficient gas-fired domestic hot water system
- Lighting System:
  - 0.50 w/s.f.

Section 2.1: LEED Energy Savings Analysis Conclusion

A comparison of the Design Building, with Mechanical System Option 2b, against the ASHRAE Standard 90.1-2010 Baseline Building results in an energy cost savings of 36.9% achieving 14 LEED points. Exceeding the MSBA required 16% energy cost savings for LEED V4 EAc2 – Optimize Energy Performance.

Note:

The values indicated above are based on energy modelling performed for system comparison purposes only. Our office strongly recommends adding a 30% safety factor to the calculated values of this report for budgeting purposes to account for potential variances to the actual operation of the building. Per ASHRAE Standard 90.1-2010:

*Neither the proposed building performance nor the baseline building performance are predictions of actual energy consumption or costs for the proposed design after construction. Actual experience will differ from these calculations due to variations such as occupancy, building operation and maintenance, weather, energy use not covered by this procedure, changes in energy rates between design of the building and occupancy, and the precision of the calculation tool.*

GARCIA • GALUSKA • DESOUSA
Consulting Engineers Inc.
370 Faunce Corner Road, Dartmouth, MA 02747-1217

## Fuller Middle School - Mechanical System Payback Summary

| Baseline | System | Gross Capital Investment* | Annual Elec. Cons. (kWh) | Annual Gas Cons. (MBTU) | Annual Electric Cost | Annual Gas Cost | Combined Utility Cost | Annual Utility $/s.f. | Annual kBTU/s.f. (EUI) | Annual Maint. Cost | Combined Annual Expense | Combined Expense Savings** | Total Life-Cycle Savings*** | Discounted Payback (Years)**** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - | 1. Hot water coil heating/chilled water coil cooling VAV AHU system with energy recovery (where code required) and terminal VAV boxes with hot water reheat coils<br>2. Code efficient gas-fired non-condensing boiler plant<br>3. High efficiency (code) water-cooled chiller plant with cooling tower | $7,490,250 | 951,950 | 4,287.9 | $175,064 | $31,718 | $206,782 | $1.38 | 50.2 | $31,225 | $238,007 | - | - | - |

| Option | System | Gross Capital Investment* | Annual Elec. Cons. (kWh) | Annual Gas Cons. (MBTU) | Annual Electric Cost | Annual Gas Cost | Combined Utility Cost | Annual Utility $/s.f. | Annual kBTU/s.f. (EUI) | Annual Maint. Cost | Combined Annual Expense | Combined Expense Savings** | Total Life-Cycle Savings*** | Discounted Payback (Years)**** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1. Hot water coil heating/chilled water coil cooling VAV AHU system with energy recovery and terminal VAV boxes with hot water reheat coils and CO2 controls<br>2. High efficiency gas-fired condensing boiler plant<br>3. High efficiency (code) water-cooled chiller plant with cooling tower | $7,595,750 | 951,320 | 3,612.6 | $174,949 | $26,722 | $201,671 | $1.34 | 45.7 | $31,225 | $232,896 | $5,111 | $21,899 | 25 |
| 2 | 1. Full air-conditioning displacement ventilation diffusers with passive heating radiation<br>2. Hot water coil heating/chilled water cooling VAV ventilating units with energy recovery with terminal VAV boxes with CO2 controls<br>3. High efficiency gas-fired condensing boiler plant<br>4. High efficiency water-cooled chiller plant with cooling tower | $7,326,500 | 650,930 | 2,949.7 | $119,706 | $21,819 | $141,525 | $0.94 | 34.5 | $26,900 | $168,425 | $69,582 | $1,844,797 | Instant****** |
| 2a | 1. Full air-conditioning displacement ventilation diffusers with passive heating radiation<br>2. Hot water coil heating/chilled water cooling VAV ventilating units with static plate energy recovery with terminal VAV boxes with CO2 controls<br>3. High efficiency gas-fired condensing boiler plant<br>4. High efficiency water-cooled chiller plant with cooling tower | $7,380,000 | 666,870 | 2,961.0 | $122,637 | $21,903 | $144,540 | $0.96 | 34.9 | $24,900 | $169,440 | $68,567 | $1,761,490 | Instant****** |
| 2b | 1. Full air-conditioning displacement ventilation diffusers with passive heating radiation<br>2. Hot water coil heating/chilled water cooling VAV ventilating units with static plate energy recovery with terminal VAV boxes with CO2 controls<br>3. High efficiency gas-fired condensing boiler plant<br>4. High efficiency air-cooled chiller plant | $7,317,500 | 657,560 | 2,961.0 | $120,925 | $21,903 | $142,828 | $0.95 | 34.7 | $23,700 | $166,528 | $71,479 | $1,891,411 | Instant****** |
| 3 | 1. Displacement ventilation diffusers providing full air-conditioning with passive chilled beam cooling/heating radiation<br>2. Hot water coil heating/chilled water cooling VAV ventilating units with energy recovery with terminal VAV boxes with CO2 controls<br>3. High efficiency gas-fired condensing boiler plant<br>4. High efficiency water-cooled chiller plant with cooling tower | $7,274,750 | 639,710 | 2,958.5 | $117,643 | $21,884 | $139,527 | $0.93 | 34.3 | $30,250 | $169,777 | $68,230 | $1,872,422 | Instant****** |
| 3a | 1. Displacement ventilation diffusers providing full air-conditioning with passive chilled beam cooling/heating radiation<br>2. Hot water coil heating/chilled water cooling VAV ventilating units with static plate energy recovery with terminal VAV boxes with CO2 controls<br>3. High efficiency gas-fired condensing boiler plant<br>4. High efficiency water-cooled chiller plant with cooling tower | $7,319,100 | 652,030 | 2,959.6 | $119,908 | $21,892 | $141,800 | $0.95 | 34.6 | $28,250 | $170,050 | $67,957 | $1,816,268 | Instant****** |
| 3b | 1. Displacement ventilation diffusers providing full air-conditioning with passive chilled beam cooling/heating radiation<br>2. Hot water coil heating/chilled water cooling VAV ventilating units with static plate energy recovery with terminal VAV boxes<br>3. High efficiency gas-fired condensing boiler plant<br>4. High efficiency air-cooled chiller plant | $7,256,600 | 647,400 | 2,959.6 | $119,057 | $21,892 | $140,949 | $0.94 | 34.5 | $27,050 | $167,999 | $70,008 | $1,925,347 | Instant****** |
| 4 | 1. Displacement ventilation diffusers providing full air-conditioning with passive chilled beam cooling/heating radiation<br>2. Hot water coil heating/chilled water cooling VAV ventilating units with static plate energy recovery with terminal VAV boxes<br>3. High efficiency gas-fired condensing boiler plant<br>4. Geothermal wells with water-to-water source heat pump chillers | $10,119,500 | 861,810 | 1,395.4 | $158,487 | $10,322 | $168,809 | $1.13 | 28.9 | $25,900 | $194,709 | $43,298 | -$1,578,949 | N/A****** |

* Gross capital investment based upon in-house cost estimate utilizing cost data from similar past projects and industry standard estimating references. Costs have been estimated for system comparison purposes only and do not incorporate all supplemental/independent HVAC system costs which would be required for all systems studied (i.e. kitchen exhaust, overhead and profit).
** Combined expense savings is the difference between the combined annual expense of the baseline and system in comparison.
*** Total life-cycle savings is based on a 30 year study period.
**** Discounted payback years is based upon BLCC5 Life Cycle Analysis.
***** Discounted payback never reached within 30 year study period.
****** Discounted payback never reached because system is more efficient and/or less expensive than baseline system.

Note 1: Values based on energy model performed for HVAC System Life Cycle Cost Analysis purposes. A 30% safety factor should be applied for budgeting purposes to account for potential variances to the actual operation of the building. Per ASHRAE Standard 90.1-2010:

*Neither the proposed building performance nor the baseline building performance are predictions of actual energy consumption or costs for the proposed design after construction. Actual experience will differ from these calculations due to variations such as occupancy, building operation and maintenance, weather, energy use not covered by this procedure, changes in energy rates between design of the building and occupancy, and the precision of the calculation tool.*

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Consulting Engineers Inc.
370 Faunce Corner Road, Dartmouth, MA 02747-1217

## Fuller Middle School - LEED Energy Savings Summary

| Baseline | System | Annual Elec. Cons. (kWh) | Annual Gas Cons. (MBTU) | Annual Electric Cost | Annual Gas Cost | Combined Utility Cost | Annual Utility $/s.f. | Annual kBTU/s.f. (EUI) | Combined Expense Savings* | Energy Cost Savings Percentage | LEED EAc2 Points |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LEED Baseline | 1. ASHRAE Standard 90.1-2010 Envelope (Wall Insulation R-13 + R-7.5 c.i., Roof Insulation R-20 c.i., Windows 0.55 U-Value/0.40 SHGC, Curtainwall 0.45 U-Value/0.40 SHGC)<br>2. ASHRAE Standard 90.1-2010 Mechanical Systems (System 7 - Packaged VAV w/ Reheat with 0.68 kW/ton Water-Cooled Chillers and 82% Eff. Hot Water Boilers)<br>3. ASHRAE Standard 90.1-2010 Lighting System (0.99 w/s.f.)<br>4. ASHRAE Standard 90.1-2010 Domestic Hot Water Systems (82% Eff. Hot Water Heaters) | 1,059,800 | 4,263.4 | $194,891 | $31,536 | $226,427 | $1.51 | 52.53 | - | - | - |

| Option | System | Annual Elec. Cons. (kWh) | Annual Gas Cons. (MBTU) | Annual Electric Cost | Annual Gas Cost | Combined Utility Cost | Annual Utility $/s.f. | Annual kBTU/s.f. (EUI) | Combined Expense Savings* | Energy Cost Savings Percentage | LEED EAc2 Points |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2b | 1. Design Envelope (Wall Insulation R-12 c.i., Pre-Engineered Walls: R-22 c.i., Roof Insulation R-36 c.i., Windows 0.45 U-Value/0.39 SHGC, Curtainwall 0.38 U-Value/0.39 SHGC)<br>2. Design Mechanical Systems (VAV Full AC Displacement Ventilation Static Plate ERV Systems and 1.05 High-Efficiency kW/ton Air-Cooled Chillers and 94% High-Efficiency Condensing Boilers)<br>3. Design High-Efficiency Lighting System (0.5 w/s.f.)<br>4. Design High-Efficiency Domestic Hot Water Systems (94% Eff. Hot Water Heaters) | 657,560 | 2,961.0 | $120,925 | $21,903 | $142,828 | $0.95 | 34.70 | $83,599 | **36.9%** | **14** |

*Combined expense savings is the difference between the combined annual expense of the baseline and building in comparison.

# LIFE CYCLE ANALYSES

# NIST BLCC 5.3-15: Comparative Analysis

**Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94**

## Base Case: Baseline - VAV

## Alternative: Option 1 - VAV

## General Information

| | |
|---|---|
| **File Name:** | C:\Users\keith_lane\BLCC 5\projects\Fuller Middle School.xml |
| **Date of Study:** | Thu Jul 26 10:08:42 EDT 2018 |
| **Project Name:** | Fuller Middle School |
| **Project Location:** | Massachusetts |
| **Analysis Type:** | OMB Analysis, Non-Energy Project |
| **Analysis Purpose:** | Public Investment or Regulatory Analysis |
| **Analyst:** | Keith Lane |
| **Base Date:** | September 1, 2020 |
| **Service Date:** | September 1, 2020 |
| **Study Period:** | 30 years 0 months(September 1, 2020 through August 31, 2050) |
| **Discount Rate:** | 4.3% |
| **Discounting Convention:** | End-of-Year |

# Comparison of Present-Value Costs

## PV Life-Cycle Cost

| | Base Case | Alternative | Savings from Alternative |
|---|---|---|---|
| **Initial Investment Costs:** | | | |
| **Capital Requirements as of Base Date** | $7,490,250 | $7,595,750 | -$105,500 |
| **Future Costs:** | | | |
| **Energy Consumption Costs** | $5,030,611 | $4,903,211 | $127,399 |
| **Energy Demand Charges** | $0 | $0 | $0 |
| **Energy Utility Rebates** | $0 | $0 | $0 |
| **Water Costs** | $0 | $0 | $0 |
| **Recurring and Non-Recurring OM&R Costs** | $675,485 | $675,485 | $0 |
| **Capital Replacements** | $0 | $0 | $0 |
| **Residual Value at End of Study Period** | $0 | $0 | $0 |
| | --- | --- | --- |
| **Subtotal (for Future Cost Items)** | $5,706,095 | $5,578,696 | $127,399 |
| | --- | --- | --- |
| **Total PV Life-Cycle Cost** | $13,196,345 | $13,174,446 | $21,899 |

## Net Savings from Alternative Compared with Base Case

**PV of Non-Investment Savings** $127,399

| | |
|---|---|
| **- Increased Total Investment** | $105,500 |
| | --- |
| **Net Savings** | $21,899 |

## Savings-to-Investment Ratio (SIR)

**SIR =** 1.21

## Adjusted Internal Rate of Return

**AIRR =** 4.96%

## Payback Period

### Estimated Years to Payback (from beginning of Service Period)

| | |
|---|---|
| **Simple Payback occurs in year** | 17 |
| **Discounted Payback occurs in year** | 25 |

# Energy Savings Summary

## Energy Savings Summary (in stated units)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 951,950.0 kWh | 951,320.0 kWh | 630.0 kWh | 18,897.4 kWh |
| **Natural Gas** | 42,879.0 Therm | 36,126.0 Therm | 6,753.0 Therm | 202,562.3 Therm |

## Energy Savings Summary (in MBtu)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 3,248.2 MBtu | 3,246.0 MBtu | 2.1 MBtu | 64.5 MBtu |
| **Natural Gas** | 4,287.9 MBtu | 3,612.6 MBtu | 675.3 MBtu | 20,256.3 MBtu |

# Emissions Reduction Summary

| Energy Type | -----Average Base Case | Annual Alternative | Emissions----- Reduction | Life-Cycle Reduction |
|---|---|---|---|---|
| **Electricity** | | | | |
| **CO2** | 586,203.48 kg | 585,815.53 kg | 387.95 kg | 11,636.88 kg |
| **SO2** | 1,628.06 kg | 1,626.98 kg | 1.08 kg | 32.32 kg |
| **NOx** | 510.70 kg | 510.36 kg | 0.34 kg | 10.14 kg |
| **Natural Gas** | | | | |
| **CO2** | 226,502.05 kg | 190,830.31 kg | 35,671.74 kg | 1,070,005.56 kg |
| **SO2** | 1,827.94 kg | 1,540.06 kg | 287.88 kg | 8,635.28 kg |
| **NOx** | 190.03 kg | 57.18 kg | 132.85 kg | 3,985.05 kg |
| **Total:** | | | | |

| | | | | |
|---|---|---|---|---|
| **CO2** | 812,705.53 kg | 776,645.84 kg | 36,059.68 kg | 1,081,642.44 kg |
| **SO2** | 3,456.00 kg | 3,167.04 kg | 288.96 kg | 8,667.60 kg |
| **NOx** | 700.73 kg | 567.54 kg | 133.19 kg | 3,995.19 kg |

# NIST BLCC 5.3-15: Comparative Analysis

**Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94**

## Base Case: Baseline - VAV

## Alternative: Option 2 - Full AC Displacement

## General Information

| | |
|---|---|
| **File Name:** | C:\Users\keith_lane\BLCC 5\projects\Fuller Middle School.xml |
| **Date of Study:** | Thu Jul 26 10:09:12 EDT 2018 |
| **Project Name:** | Fuller Middle School |
| **Project Location:** | Massachusetts |
| **Analysis Type:** | OMB Analysis, Non-Energy Project |
| **Analysis Purpose:** | Public Investment or Regulatory Analysis |
| **Analyst:** | Keith Lane |
| **Base Date:** | September 1, 2020 |
| **Service Date:** | September 1, 2020 |
| **Study Period:** | 30 years 0 months(September 1, 2020 through August 31, 2050) |
| **Discount Rate:** | 4.3% |
| **Discounting Convention:** | End-of-Year |

# Comparison of Present-Value Costs

## PV Life-Cycle Cost

| | Base Case | Alternative | Savings from Alternative |
|---|---|---|---|
| **Initial Investment Costs:** | | | |
| **Capital Requirements as of Base Date** | $7,490,250 | $7,326,500 | $163,750 |
| **Future Costs:** | | | |
| **Energy Consumption Costs** | $5,030,611 | $3,443,125 | $1,587,485 |
| **Energy Demand Charges** | $0 | $0 | $0 |
| **Energy Utility Rebates** | $0 | $0 | $0 |
| **Water Costs** | $0 | $0 | $0 |
| **Recurring and Non-Recurring OM&R Costs** | $675,485 | $581,923 | $93,562 |
| **Capital Replacements** | $0 | $0 | $0 |
| **Residual Value at End of Study Period** | $0 | $0 | $0 |
| | --- | --- | --- |
| **Subtotal (for Future Cost Items)** | $5,706,095 | $4,025,048 | $1,681,047 |
| | --- | --- | --- |
| **Total PV Life-Cycle Cost** | $13,196,345 | $11,351,548 | $1,844,797 |

## Net Savings from Alternative Compared with Base Case

**PV of Non-Investment Savings** $1,681,047

| | |
|---|---|
| **- Increased Total Investment** | -$163,750 |
| | --- |
| **Net Savings** | $1,844,797 |

**NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.**

# Energy Savings Summary

## Energy Savings Summary (in stated units)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 951,950.0 kWh | 650,930.0 kWh | 301,020.0 kWh | 9,029,363.8 kWh |
| **Natural Gas** | 42,879.0 Therm | 29,497.0 Therm | 13,382.0 Therm | 401,405.0 Therm |

## Energy Savings Summary (in MBtu)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 3,248.2 MBtu | 2,221.1 MBtu | 1,027.1 MBtu | 30,809.5 MBtu |
| **Natural Gas** | 4,287.9 MBtu | 2,949.7 MBtu | 1,338.2 MBtu | 40,140.7 MBtu |

# Emissions Reduction Summary

| Energy Type | -----Average Base Case | Annual Alternative | Emissions----- Reduction | Life-Cycle Reduction |
|---|---|---|---|---|
| **Electricity** | | | | |
| **CO2** | 586,203.48 kg | 400,837.68 kg | 185,365.80 kg | 5,560,212.66 kg |
| **SO2** | 1,628.06 kg | 1,113.24 kg | 514.81 kg | 15,442.33 kg |
| **NOx** | 510.70 kg | 349.21 kg | 161.49 kg | 4,844.01 kg |
| **Natural Gas** | | | | |
| **CO2** | 226,502.05 kg | 155,813.59 kg | 70,688.46 kg | 2,120,363.46 kg |
| **SO2** | 1,827.94 kg | 1,257.46 kg | 570.48 kg | 17,112.00 kg |
| **NOx** | 190.03 kg | 46.69 kg | 143.35 kg | 4,299.78 kg |
| **Total:** | | | | |
| **CO2** | 812,705.53 kg | 556,651.27 kg | 256,054.26 kg | 7,680,576.13 kg |
| **SO2** | 3,456.00 kg | 2,370.71 kg | 1,085.29 kg | 32,554.33 kg |
| **NOx** | 700.73 kg | 395.89 kg | 304.83 kg | 9,143.79 kg |

# NIST BLCC 5.3-15: Comparative Analysis

**Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94**

## Base Case: Baseline - VAV

## Alternative: Option 2A - Static Plate ERV Full AC Displacement

## General Information

| | |
|---|---|
| **File Name:** | C:\Users\keith_lane\BLCC 5\projects\Fuller Middle School.xml |
| **Date of Study:** | Thu Jul 26 10:09:47 EDT 2018 |
| **Project Name:** | Fuller Middle School |
| **Project Location:** | Massachusetts |
| **Analysis Type:** | OMB Analysis, Non-Energy Project |
| **Analysis Purpose:** | Public Investment or Regulatory Analysis |
| **Analyst:** | Keith Lane |
| **Base Date:** | September 1, 2020 |
| **Service Date:** | September 1, 2020 |
| **Study Period:** | 30 years 0 months(September 1, 2020 through August 31, 2050) |
| **Discount Rate:** | 4.3% |
| **Discounting Convention:** | End-of-Year |

# Comparison of Present-Value Costs

## PV Life-Cycle Cost

| | Base Case | Alternative | Savings from Alternative |
|---|---|---|---|
| **Initial Investment Costs:** | | | |
| **Capital Requirements as of Base Date** | $7,490,250 | $7,380,000 | $110,250 |
| **Future Costs:** | | | |
| **Energy Consumption Costs** | $5,030,611 | $3,516,199 | $1,514,412 |
| **Energy Demand Charges** | $0 | $0 | $0 |
| **Energy Utility Rebates** | $0 | $0 | $0 |
| **Water Costs** | $0 | $0 | $0 |
| **Recurring and Non-Recurring OM&R Costs** | $675,485 | $538,657 | $136,828 |
| **Capital Replacements** | $0 | $0 | $0 |
| **Residual Value at End of Study Period** | $0 | $0 | $0 |
| | --- | --- | --- |
| **Subtotal (for Future Cost Items)** | $5,706,095 | $4,054,856 | $1,651,240 |
| | --- | --- | --- |
| **Total PV Life-Cycle Cost** | $13,196,345 | $11,434,856 | $1,761,490 |

## Net Savings from Alternative Compared with Base Case

**PV of Non-Investment Savings** $1,651,240

| | |
|---|---|
| **- Increased Total Investment** | -$110,250 |
| | --- |
| **Net Savings** | $1,761,490 |

**NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.**

# Energy Savings Summary

## Energy Savings Summary (in stated units)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 951,950.0 kWh | 666,870.0 kWh | 285,080.0 kWh | 8,551,229.2 kWh |
| **Natural Gas** | 42,879.0 Therm | 29,610.0 Therm | 13,269.0 Therm | 398,015.5 Therm |

## Energy Savings Summary (in MBtu)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 3,248.2 MBtu | 2,275.5 MBtu | 972.7 MBtu | 29,178.0 MBtu |
| **Natural Gas** | 4,287.9 MBtu | 2,961.0 MBtu | 1,326.9 MBtu | 39,801.7 MBtu |

# Emissions Reduction Summary

| Energy Type | -----Average Base Case | Annual Alternative | Emissions----- Reduction | Life-Cycle Reduction |
|---|---|---|---|---|
| **Electricity** | | | | |
| **CO2** | 586,203.48 kg | 410,653.41 kg | 175,550.07 kg | 5,265,781.10 kg |
| **SO2** | 1,628.06 kg | 1,140.50 kg | 487.55 kg | 14,624.60 kg |
| **NOx** | 510.70 kg | 357.76 kg | 152.94 kg | 4,587.51 kg |
| **Natural Gas** | | | | |
| **CO2** | 226,502.05 kg | 156,410.50 kg | 70,091.55 kg | 2,102,458.73 kg |
| **SO2** | 1,827.94 kg | 1,262.28 kg | 565.66 kg | 16,967.51 kg |
| **NOx** | 190.03 kg | 46.87 kg | 143.17 kg | 4,294.42 kg |
| **Total:** | | | | |
| **CO2** | 812,705.53 kg | 567,063.91 kg | 245,641.62 kg | 7,368,239.83 kg |
| **SO2** | 3,456.00 kg | 2,402.79 kg | 1,053.21 kg | 31,592.11 kg |
| **NOx** | 700.73 kg | 404.62 kg | 296.10 kg | 8,881.92 kg |

# NIST BLCC 5.3-15: Comparative Analysis

**Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94**

## Base Case: Baseline - VAV

## Alternative: Option 2B - ACC Static Plate ERV Full AC Displacement

## General Information

| | |
|---|---|
| **File Name:** | C:\Users\keith_lane\BLCC 5\projects\Fuller Middle School.xml |
| **Date of Study:** | Thu Jul 26 10:10:22 EDT 2018 |
| **Project Name:** | Fuller Middle School |
| **Project Location:** | Massachusetts |
| **Analysis Type:** | OMB Analysis, Non-Energy Project |
| **Analysis Purpose:** | Public Investment or Regulatory Analysis |
| **Analyst:** | Keith Lane |
| **Base Date:** | September 1, 2020 |
| **Service Date:** | September 1, 2020 |
| **Study Period:** | 30 years 0 months(September 1, 2020 through August 31, 2050) |
| **Discount Rate:** | 4.3% |
| **Discounting Convention:** | End-of-Year |

# Comparison of Present-Value Costs

## PV Life-Cycle Cost

| | Base Case | Alternative | Savings from Alternative |
|---|---|---|---|
| **Initial Investment Costs:** | | | |
| **Capital Requirements as of Base Date** | $7,490,250 | $7,317,500 | $172,750 |
| **Future Costs:** | | | |
| **Energy Consumption Costs** | $5,030,611 | $3,474,737 | $1,555,874 |
| **Energy Demand Charges** | $0 | $0 | $0 |
| **Energy Utility Rebates** | $0 | $0 | $0 |
| **Water Costs** | $0 | $0 | $0 |
| **Recurring and Non-Recurring OM&R Costs** | $675,485 | $512,698 | $162,787 |
| **Capital Replacements** | $0 | $0 | $0 |
| **Residual Value at End of Study Period** | $0 | $0 | $0 |
| | --- | --- | --- |
| **Subtotal (for Future Cost Items)** | $5,706,095 | $3,987,435 | $1,718,661 |
| | --- | --- | --- |
| **Total PV Life-Cycle Cost** | $13,196,345 | $11,304,935 | $1,891,411 |

## Net Savings from Alternative Compared with Base Case

**PV of Non-Investment Savings** $1,718,661

| | |
|---|---|
| **- Increased Total Investment** | -$172,750 |
| | --- |
| **Net Savings** | $1,891,411 |

**NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.**

# Energy Savings Summary

## Energy Savings Summary (in stated units)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 951,950.0 kWh | 657,560.0 kWh | 294,390.0 kWh | 8,830,491.0 kWh |
| **Natural Gas** | 42,879.0 Therm | 29,610.0 Therm | 13,269.0 Therm | 398,015.5 Therm |

## Energy Savings Summary (in MBtu)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 3,248.2 MBtu | 2,243.7 MBtu | 1,004.5 MBtu | 30,130.9 MBtu |
| **Natural Gas** | 4,287.9 MBtu | 2,961.0 MBtu | 1,326.9 MBtu | 39,801.7 MBtu |

# Emissions Reduction Summary

| Energy Type | -----Average Base Case | Annual Alternative | Emissions----- Reduction | Life-Cycle Reduction |
|---|---|---|---|---|
| **Electricity** | | | | |
| **CO2** | 586,203.48 kg | 404,920.38 kg | 181,283.09 kg | 5,437,748.34 kg |
| **SO2** | 1,628.06 kg | 1,124.58 kg | 503.48 kg | 15,102.21 kg |
| **NOx** | 510.70 kg | 352.76 kg | 157.93 kg | 4,737.32 kg |
| **Natural Gas** | | | | |
| **CO2** | 226,502.05 kg | 156,410.50 kg | 70,091.55 kg | 2,102,458.73 kg |
| **SO2** | 1,827.94 kg | 1,262.28 kg | 565.66 kg | 16,967.51 kg |
| **NOx** | 190.03 kg | 46.87 kg | 143.17 kg | 4,294.42 kg |
| **Total:** | | | | |
| **CO2** | 812,705.53 kg | 561,330.88 kg | 251,374.65 kg | 7,540,207.08 kg |
| **SO2** | 3,456.00 kg | 2,386.86 kg | 1,069.14 kg | 32,069.71 kg |
| **NOx** | 700.73 kg | 399.63 kg | 301.10 kg | 9,031.74 kg |

# NIST BLCC 5.3-15: Comparative Analysis

**Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94**

## Base Case: Baseline - VAV

## Alternative: Option 3 - CB Full AC Displacement

## General Information

| | |
|---|---|
| **File Name:** | C:\Users\keith_lane\BLCC 5\projects\Fuller Middle School.xml |
| **Date of Study:** | Thu Jul 26 10:10:43 EDT 2018 |
| **Project Name:** | Fuller Middle School |
| **Project Location:** | Massachusetts |
| **Analysis Type:** | OMB Analysis, Non-Energy Project |
| **Analysis Purpose:** | Public Investment or Regulatory Analysis |
| **Analyst:** | Keith Lane |
| **Base Date:** | September 1, 2020 |
| **Service Date:** | September 1, 2020 |
| **Study Period:** | 30 years 0 months(September 1, 2020 through August 31, 2050) |
| **Discount Rate:** | 4.3% |
| **Discounting Convention:** | End-of-Year |

# Comparison of Present-Value Costs

## PV Life-Cycle Cost

| | Base Case | Alternative | Savings from Alternative |
|---|---|---|---|
| **Initial Investment Costs:** | | | |
| **Capital Requirements as of Base Date** | $7,490,250 | $7,274,750 | $215,500 |
| **Future Costs:** | | | |
| **Energy Consumption Costs** | $5,030,611 | $3,394,781 | $1,635,830 |
| **Energy Demand Charges** | $0 | $0 | $0 |
| **Energy Utility Rebates** | $0 | $0 | $0 |
| **Water Costs** | $0 | $0 | $0 |
| **Recurring and Non-Recurring OM&R Costs** | $675,485 | $654,393 | $21,092 |
| **Capital Replacements** | $0 | $0 | $0 |
| **Residual Value at End of Study Period** | $0 | $0 | $0 |
| | --- | --- | --- |
| **Subtotal (for Future Cost Items)** | $5,706,095 | $4,049,174 | $1,656,922 |
| | --- | --- | --- |
| **Total PV Life-Cycle Cost** | $13,196,345 | $11,323,924 | $1,872,422 |

## Net Savings from Alternative Compared with Base Case

**PV of Non-Investment Savings** $1,656,922

| | |
|---|---|
| **- Increased Total Investment** | -$215,500 |
| | --- |
| **Net Savings** | $1,872,422 |

**NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.**

# Energy Savings Summary

## Energy Savings Summary (in stated units)

| Energy Type | Average Base Case | Annual Alternative | Consumption Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 951,950.0 kWh | 639,710.0 kWh | 312,240.0 kWh | 9,365,917.7 kWh |
| **Natural Gas** | 42,879.0 Therm | 29,585.0 Therm | 13,294.0 Therm | 398,765.4 Therm |

## Energy Savings Summary (in MBtu)

| Energy Type | Average Base Case | Annual Alternative | Consumption Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 3,248.2 MBtu | 2,182.8 MBtu | 1,065.4 MBtu | 31,957.8 MBtu |
| **Natural Gas** | 4,287.9 MBtu | 2,958.5 MBtu | 1,329.4 MBtu | 39,876.7 MBtu |

# Emissions Reduction Summary

| Energy Type | Average Base Case | Annual Alternative | Emissions Reduction | Life-Cycle Reduction |
|---|---|---|---|---|
| **Electricity** | | | | |
| **CO2** | 586,203.48 kg | 393,928.49 kg | 192,274.99 kg | 5,767,459.98 kg |
| **SO2** | 1,628.06 kg | 1,094.05 kg | 534.00 kg | 16,017.91 kg |
| **NOx** | 510.70 kg | 343.19 kg | 167.51 kg | 5,024.57 kg |
| **Natural Gas** | | | | |
| **CO2** | 226,502.05 kg | 156,278.44 kg | 70,223.61 kg | 2,106,419.96 kg |
| **SO2** | 1,827.94 kg | 1,261.22 kg | 566.73 kg | 16,999.47 kg |
| **NOx** | 190.03 kg | 46.83 kg | 143.21 kg | 4,295.60 kg |
| **Total:** | | | | |
| **CO2** | 812,705.53 kg | 550,206.93 kg | 262,498.60 kg | 7,873,879.93 kg |
| **SO2** | 3,456.00 kg | 2,355.27 kg | 1,100.73 kg | 33,017.39 kg |
| **NOx** | 700.73 kg | 390.01 kg | 310.71 kg | 9,320.17 kg |

# NIST BLCC 5.3-15: Comparative Analysis

**Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94**

## Base Case: Baseline - VAV

## Alternative: Option 3A - Static Plate ERV CB Full AC Displacement

## General Information

| | |
|---|---|
| **File Name:** | C:\Users\keith_lane\BLCC 5\projects\Fuller Middle School.xml |
| **Date of Study:** | Thu Jul 26 10:11:16 EDT 2018 |
| **Project Name:** | Fuller Middle School |
| **Project Location:** | Massachusetts |
| **Analysis Type:** | OMB Analysis, Non-Energy Project |
| **Analysis Purpose:** | Public Investment or Regulatory Analysis |
| **Analyst:** | Keith Lane |
| **Base Date:** | September 1, 2020 |
| **Service Date:** | September 1, 2020 |
| **Study Period:** | 30 years 0 months(September 1, 2020 through August 31, 2050) |
| **Discount Rate:** | 4.3% |
| **Discounting Convention:** | End-of-Year |

# Comparison of Present-Value Costs

## PV Life-Cycle Cost

| | Base Case | Alternative | Savings from Alternative |
|---|---|---|---|
| **Initial Investment Costs:** | | | |
| **Capital Requirements as of Base Date** | $7,490,250 | $7,319,100 | $171,150 |
| **Future Costs:** | | | |
| **Energy Consumption Costs** | $5,030,611 | $3,449,851 | $1,580,760 |
| **Energy Demand Charges** | $0 | $0 | $0 |
| **Energy Utility Rebates** | $0 | $0 | $0 |
| **Water Costs** | $0 | $0 | $0 |
| **Recurring and Non-Recurring OM&R Costs** | $675,485 | $611,127 | $64,358 |
| **Capital Replacements** | $0 | $0 | $0 |
| **Residual Value at End of Study Period** | $0 | $0 | $0 |
| | --- | --- | --- |
| **Subtotal (for Future Cost Items)** | $5,706,095 | $4,060,978 | $1,645,118 |
| | --- | --- | --- |
| **Total PV Life-Cycle Cost** | $13,196,345 | $11,380,078 | $1,816,268 |

## Net Savings from Alternative Compared with Base Case

**PV of Non-Investment Savings** $1,645,118

| | |
|---|---|
| **- Increased Total Investment** | -$171,150 |
| | --- |
| **Net Savings** | $1,816,268 |

**NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.**

# Energy Savings Summary

## Energy Savings Summary (in stated units)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 951,950.0 kWh | 652,030.0 kWh | 299,920.0 kWh | 8,996,368.3 kWh |
| **Natural Gas** | 42,879.0 Therm | 29,596.0 Therm | 13,283.0 Therm | 398,435.4 Therm |

## Energy Savings Summary (in MBtu)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 3,248.2 MBtu | 2,224.8 MBtu | 1,023.4 MBtu | 30,696.9 MBtu |
| **Natural Gas** | 4,287.9 MBtu | 2,959.6 MBtu | 1,328.3 MBtu | 39,843.7 MBtu |

# Emissions Reduction Summary

| Energy Type | -----Average Base Case | Annual Alternative | Emissions----- Reduction | Life-Cycle Reduction |
|---|---|---|---|---|
| **Electricity** | | | | |
| **CO2** | 586,203.48 kg | 401,515.05 kg | 184,688.43 kg | 5,539,894.30 kg |
| **SO2** | 1,628.06 kg | 1,115.12 kg | 512.93 kg | 15,385.90 kg |
| **NOx** | 510.70 kg | 349.80 kg | 160.90 kg | 4,826.31 kg |
| **Natural Gas** | | | | |
| **CO2** | 226,502.05 kg | 156,336.54 kg | 70,165.51 kg | 2,104,677.02 kg |
| **SO2** | 1,827.94 kg | 1,261.69 kg | 566.26 kg | 16,985.41 kg |
| **NOx** | 190.03 kg | 46.84 kg | 143.19 kg | 4,295.08 kg |
| **Total:** | | | | |
| **CO2** | 812,705.53 kg | 557,851.60 kg | 254,853.93 kg | 7,644,571.32 kg |
| **SO2** | 3,456.00 kg | 2,376.81 kg | 1,079.19 kg | 32,371.30 kg |
| **NOx** | 700.73 kg | 396.64 kg | 304.09 kg | 9,121.39 kg |

# NIST BLCC 5.3-15: Comparative Analysis

**Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94**

## Base Case: Baseline - VAV

## Alternative: Option 3B - ACC Static Plate ERV CB Full AC Displacement

## General Information

| | |
|---|---|
| **File Name:** | C:\Users\keith_lane\BLCC 5\projects\Fuller Middle School.xml |
| **Date of Study:** | Thu Jul 26 10:11:37 EDT 2018 |
| **Project Name:** | Fuller Middle School |
| **Project Location:** | Massachusetts |
| **Analysis Type:** | OMB Analysis, Non-Energy Project |
| **Analysis Purpose:** | Public Investment or Regulatory Analysis |
| **Analyst:** | Keith Lane |
| **Base Date:** | September 1, 2020 |
| **Service Date:** | September 1, 2020 |
| **Study Period:** | 30 years 0 months(September 1, 2020 through August 31, 2050) |
| **Discount Rate:** | 4.3% |
| **Discounting Convention:** | End-of-Year |

# Comparison of Present-Value Costs

## PV Life-Cycle Cost

| | Base Case | Alternative | Savings from Alternative |
|---|---|---|---|
| **Initial Investment Costs:** | | | |
| **Capital Requirements as of Base Date** | $7,490,250 | $7,256,600 | $233,650 |
| **Future Costs:** | | | |
| **Energy Consumption Costs** | $5,030,611 | $3,429,231 | $1,601,380 |
| **Energy Demand Charges** | $0 | $0 | $0 |
| **Energy Utility Rebates** | $0 | $0 | $0 |
| **Water Costs** | $0 | $0 | $0 |
| **Recurring and Non-Recurring OM&R Costs** | $675,485 | $585,168 | $90,317 |
| **Capital Replacements** | $0 | $0 | $0 |
| **Residual Value at End of Study Period** | $0 | $0 | $0 |
| | --- | --- | --- |
| **Subtotal (for Future Cost Items)** | $5,706,095 | $4,014,399 | $1,691,697 |
| | --- | --- | --- |
| **Total PV Life-Cycle Cost** | $13,196,345 | $11,270,999 | $1,925,347 |

## Net Savings from Alternative Compared with Base Case

**PV of Non-Investment Savings** $1,691,697

| | |
|---|---|
| **- Increased Total Investment** | -$233,650 |
| | --- |
| **Net Savings** | $1,925,347 |

**NOTE: Meaningful SIR, AIRR and Payback can not be computed unless incremental savings and total savings are both positive.**

# Energy Savings Summary

## Energy Savings Summary (in stated units)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 951,950.0 kWh | 647,400.0 kWh | 304,550.0 kWh | 9,135,249.3 kWh |
| **Natural Gas** | 42,879.0 Therm | 29,596.0 Therm | 13,283.0 Therm | 398,435.4 Therm |

## Energy Savings Summary (in MBtu)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 3,248.2 MBtu | 2,209.0 MBtu | 1,039.2 MBtu | 31,170.8 MBtu |
| **Natural Gas** | 4,287.9 MBtu | 2,959.6 MBtu | 1,328.3 MBtu | 39,843.7 MBtu |

# Emissions Reduction Summary

| Energy Type | -----Average Base Case | Annual Alternative | Emissions----- Reduction | Life-Cycle Reduction |
|---|---|---|---|---|
| **Electricity** | | | | |
| **CO2** | 586,203.48 kg | 398,663.93 kg | 187,539.54 kg | 5,625,416.14 kg |
| **SO2** | 1,628.06 kg | 1,107.21 kg | 520.85 kg | 15,623.41 kg |
| **NOx** | 510.70 kg | 347.31 kg | 163.38 kg | 4,900.82 kg |
| **Natural Gas** | | | | |
| **CO2** | 226,502.05 kg | 156,336.54 kg | 70,165.51 kg | 2,104,677.02 kg |
| **SO2** | 1,827.94 kg | 1,261.69 kg | 566.26 kg | 16,985.41 kg |
| **NOx** | 190.03 kg | 46.84 kg | 143.19 kg | 4,295.08 kg |
| **Total:** | | | | |
| **CO2** | 812,705.53 kg | 555,000.48 kg | 257,705.05 kg | 7,730,093.16 kg |
| **SO2** | 3,456.00 kg | 2,368.89 kg | 1,087.11 kg | 32,608.82 kg |
| **NOx** | 700.73 kg | 394.16 kg | 306.57 kg | 9,195.90 kg |

# NIST BLCC 5.3-15: Comparative Analysis

**Consistent with Federal Life Cycle Cost Methodology in OMB Circular A-94**

## Base Case: Baseline - VAV

## Alternative: Option 4 - Geothermal Static Plate ERV Full AC Displacement

## General Information

| | |
|---|---|
| **File Name:** | C:\Users\keith_lane\BLCC 5\projects\Fuller Middle School.xml |
| **Date of Study:** | Thu Jul 26 14:44:51 EDT 2018 |
| **Project Name:** | Fuller Middle School |
| **Project Location:** | Massachusetts |
| **Analysis Type:** | OMB Analysis, Non-Energy Project |
| **Analysis Purpose:** | Public Investment or Regulatory Analysis |
| **Analyst:** | Keith Lane |
| **Base Date:** | September 1, 2020 |
| **Service Date:** | September 1, 2020 |
| **Study Period:** | 30 years 0 months(September 1, 2020 through August 31, 2050) |
| **Discount Rate:** | 4.3% |
| **Discounting Convention:** | End-of-Year |

# Comparison of Present-Value Costs

## PV Life-Cycle Cost

| | Base Case | Alternative | Savings from Alternative |
|---|---|---|---|
| **Initial Investment Costs:** | | | |
| **Capital Requirements as of Base Date** | $7,490,250 | $10,119,500 | -$2,629,250 |
| **Future Costs:** | | | |
| **Energy Consumption Costs** | $5,030,611 | $4,095,504 | $935,107 |
| **Energy Demand Charges** | $0 | $0 | $0 |
| **Energy Utility Rebates** | $0 | $0 | $0 |
| **Water Costs** | $0 | $0 | $0 |
| **Recurring and Non-Recurring OM&R Costs** | $675,485 | $560,290 | $115,195 |
| **Capital Replacements** | $0 | $0 | $0 |
| **Residual Value at End of Study Period** | $0 | $0 | $0 |
| | --- | --- | --- |
| **Subtotal (for Future Cost Items)** | $5,706,095 | $4,655,794 | $1,050,301 |
| | --- | --- | --- |
| **Total PV Life-Cycle Cost** | $13,196,345 | $14,775,294 | -$1,578,949 |

## Net Savings from Alternative Compared with Base Case

**PV of Non-Investment Savings** $1,050,301

| | |
|---|---|
| **- Increased Total Investment** | $2,629,250 |
| | --- |
| **Net Savings** | -$1,578,949 |

## Savings-to-Investment Ratio (SIR)

**SIR =** 0.40

**SIR is lower than 1.0; project alternative is not cost effective.**

## Adjusted Internal Rate of Return

**AIRR =** 1.16%

**AIRR is lower than your discount rate; project alternative is not cost effective.**

## Payback Period

### Estimated Years to Payback (from beginning of Service Period)

**Simple Payback never reached during study period.**

**Discounted Payback never reached during study period.**

# Energy Savings Summary

## Energy Savings Summary (in stated units)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 951,950.0 kWh | 861,810.0 kWh | 90,140.0 kWh | 2,703,829.8 kWh |
| **Natural Gas** | 42,879.0 Therm | 13,954.0 Therm | 28,925.0 Therm | 867,631.2 Therm |

## Energy Savings Summary (in MBtu)

| Energy Type | -----Average Base Case | Annual Alternative | Consumption----- Savings | Life-Cycle Savings |
|---|---|---|---|---|
| **Electricity** | 3,248.2 MBtu | 2,940.6 MBtu | 307.6 MBtu | 9,225.8 MBtu |
| **Natural Gas** | 4,287.9 MBtu | 1,395.4 MBtu | 2,892.5 MBtu | 86,763.4 MBtu |

# Emissions Reduction Summary

| Energy Type | -----Average Base Case | Annual Alternative | Emissions----- Reduction | Life-Cycle Reduction |
|---|---|---|---|---|
| **Electricity** | | | | |
| **CO2** | 586,203.48 kg | 530,695.96 kg | 55,507.52 kg | 1,664,997.57 kg |
| **SO2** | 1,628.06 kg | 1,473.90 kg | 154.16 kg | 4,624.18 kg |
| **NOx** | 510.70 kg | 462.34 kg | 48.36 kg | 1,450.53 kg |
| **Natural Gas** | | | | |

| | | | | |
|---|---|---|---|---|
| **CO2** | 226,502.05 kg | 73,709.97 kg | 152,792.08 kg | 4,583,135.04 kg |
| **SO2** | 1,827.94 kg | 594.86 kg | 1,233.08 kg | 36,987.35 kg |
| **NOx** | 190.03 kg | 22.09 kg | 167.95 kg | 5,037.73 kg |
| **Total:** | | | | |
| **CO2** | 812,705.53 kg | 604,405.92 kg | 208,299.60 kg | 6,248,132.61 kg |
| **SO2** | 3,456.00 kg | 2,068.76 kg | 1,387.24 kg | 41,611.53 kg |
| **NOx** | 700.73 kg | 484.42 kg | 216.30 kg | 6,488.26 kg |

# COST ESTIMATES

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Consulting Engineers Inc.
370 Faunce Corner Road, Darlmouth, MA 02747-1217

**PROJECT:** Fuller Middle School

**JOB NO:** 68001500

**CLIENT:** Jonathan Levi Architects, Inc.

**DATE:** 7/16/2018 **BY:** KL

## Baseline - ASHRAE Std. 90.1-2010 CHW/HHW Coil VAV Air Handling Unit System

| ITEM OF WORK | NO. | UNIT PRICE | AREA | PRICE/S.F. | TOTAL |
|---|---|---|---|---|---|
| VAV Box with Hot Water Reheat Coils | 147 | $1,500 | | | $ 220,500 |
| RTU-1: Classrooms, Band, Stage (NW) Full AC VAV w/ ERV | 27,000 CFM | $14.5/CFM | | | $ 391,500 |
| RTU-2: Classrooms, Media, Admin (NE) Full AC VAV w/ ERV | 17,000 CFM | $14.5/CFM | | | $ 246,500 |
| RTU-3: Classrooms, Cafe (SE) Full AC VAV w/ ERV | 22,000 CFM | $14.5/CFM | | | $ 319,000 |
| RTU-4: Classrooms, Café, Tech (SW) Full AC VAV w/ ERV | 24,000 CFM | $14.5/CFM | | | $ 348,000 |
| RTU-5: Admin.(S) Full AC VAV w/ ERV | 7,500 CFM | $14.5/CFM | | | $ 108,750 |
| RTU-6: Gym Full AC VAV w/ ERV | 12,000 CFM | $14.5/CFM | | | $ 174,000 |
| RTU-7: Auditorium, Stage Full AC VAV w/ ERV | 12,000 CFM | $14.5/CFM | | | $ 174,000 |
| RTU-8: Lockers 100% O.A. Overhead w/ ERV | 3,000 CFM | $15.5/CFM | | | $ 46,500 |
| MAU-1: Kitchen MAU | 5,500 CFM | $11/CFM | | | $ 60,500 |
| (4) 2,000 MBH 80% Code-Efficient Gas-Fired Boilers | 4 | $35,000 | | | $ 140,000 |
| Pumps (HHW) including VFD's | 2 | $18,000 | | | $ 36,000 |
| (2) 175 Ton (Code) High-Efficiency TurboCor Water-Cooled Chillers Plant and Cooling Towers | 350 tons | $1,500/ton | | | $ 525,000 |
| Pumps (CHW) including VFD's | 2 | $22,500 | | | $ 45,000 |
| HHW Piping & Insulation including Terminal Heating Units | | | 150,000 | $4.75 | $ 712,500 |
| CHW Piping & Insulation and Condensate Piping | | | 150,000 | $3.25 | $ 487,500 |
| Cooling Tower Pumps and VFDs | 2 | $22,500 | | | $ 45,000 |
| Cooling Tower CW Piping | 1 | $30,000 | | | $ 30,000 |
| Ductwork including GRD's, Dampers, & General Exhaust Systems | | | 150,000 | $14.50 | $ 2,175,000 |
| ATC/DDC Controls | | | 150,000 | $5.25 | $ 787,500 |
| Split System Ductless Cooling Units | 3 | $7,500 | | | $ 22,500 |
| Exhaust Fans (Misc. Areas) | | | | | $ 20,000 |
| HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management) | | | 150,000 | $2.5 | $ 375,000 |
| | | | | **TOTAL** | $ 7,490,250 |
| | | | | **TOTAL ($/FT²)** | $ 49.94 |

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules etc.

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370 Faunce Corner Road, Darlmouth, MA 02747-1217

**PROJECT:** Fuller Middle School

**JOB NO:** 68001500

**CLIENT:** Jonathan Levi Architects, Inc.

**DATE:** 7/16/2018 **BY:** KL

## Option 1 - CHW/HHW Coil VAV Air Handling Unit System

| ITEM OF WORK | NO. | UNIT PRICE | AREA | PRICE/S.F. | TOTAL |
|---|---|---|---|---|---|
| VAV Box with Hot Water Reheat Coils | 147 | $1,500 | | | $ 220,500 |
| RTU-1: Classrooms, Band, Stage (NW) Full AC VAV w/ ERV & DCV | 27,000 CFM | $14.5/CFM | | | $ 391,500 |
| RTU-2: Classrooms, Media, Admin (NE) Full AC VAV w/ ERV & DCV | 17,000 CFM | $14.5/CFM | | | $ 246,500 |
| RTU-3: Classrooms, Cafe (SE) Full AC VAV w/ ERV & DCV | 22,000 CFM | $14.5/CFM | | | $ 319,000 |
| RTU-4: Classrooms, Café, Tech (SW) Full AC VAV w/ ERV & DCV | 24,000 CFM | $14.5/CFM | | | $ 348,000 |
| RTU-5: Admin.(S) Full AC VAV w/ ERV & DCV | 7,500 CFM | $14.5/CFM | | | $ 108,750 |
| RTU-6: Gym Full AC VAV w/ ERV & DCV | 12,000 CFM | $14.5/CFM | | | $ 174,000 |
| RTU-7: Auditorium, Stage Full AC VAV w/ ERV & DCV | 12,000 CFM | $14.5/CFM | | | $ 174,000 |
| RTU-8: Lockers 100% O.A. Overhead w/ ERV | 3,000 CFM | $15.5/CFM | | | $ 46,500 |
| MAU-1: Kitchen MAU | 5,500 CFM | $11/CFM | | | $ 60,500 |
| (4) 2,000 MBH High-Efficiency Gas-Fired Condensing Boilers | 4 | $49,000 | | | $ 196,000 |
| Pumps (HHW) including VFD's | 2 | $18,000 | | | $ 36,000 |
| (2) 175 Ton (Code) High-Efficiency TurboCor Water-Cooled Chillers Plant and Cooling Towers | 350 tons | $1,500/ton | | | $ 525,000 |
| Pumps (CHW) including VFD's | 2 | $22,500 | | | $ 45,000 |
| HHW Piping & Insulation including Terminal Heating Units | | | 150,000 | $4.75 | $ 712,500 |
| CHW Piping & Insulation and Condensate Piping | | | 150,000 | $3.25 | $ 487,500 |
| Cooling Tower Pumps and VFDs | 2 | $22,500 | | | $ 45,000 |
| Cooling Tower CW Piping | 1 | $30,000 | | | $ 30,000 |
| Ductwork including GRD's, Dampers, & General Exhaust Systems | | | 150,000 | $14.50 | $ 2,175,000 |
| ATC/DDC Controls | | | 150,000 | $5.50 | $ 825,000 |
| Split System Ductless Cooling Units | 3 | $7,500 | | | $ 22,500 |
| Exhaust Fans (Misc. Areas) | | | | | $ 32,000 |
| HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management) | | | 150,000 | $2.5 | $ 375,000 |
| | | | | **TOTAL** | $ 7,595,750 |
| | | | | **TOTAL ($/FT²)** | $ 50.64 |

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules etc.

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370 Faunce Corner Road, Dartmouth, MA 02747-1217

| | |
|---|---|
| PROJECT: | Fuller Middle School |
| JOB NO: | 68001500 |
| CLIENT: | Jonathan Levi Architects, Inc. |
| DATE: | 7/26/2018 |
| BY: | KL |

**Option 2 - VAV Full AC Displacement Ventilation Systems**

| ITEM OF WORK | NO. | UNIT PRICE | AREA | PRICE/S.F. | TOTAL |
|---|---|---|---|---|---|
| AC Displacement Diffuser Assemblies | 78 | $1,150 | | | $ 89,700 |
| Small Displacement Diffuser Assemblies (Admin.) | 51 | $850 | | | $ 43,350 |
| Large AC Displacement Diffuser Assemblies | 31 | $1,150 | | | $ 35,650 |
| VAV Box with Demand Ventilation Controls | 134 | $1,200 | | | $ 160,800 |
| RTU-1: Classrooms, Band, Stage (NW) Full AC Displacement VAV w/ ERV & DCV | 23,000 CFM | $14.5/CFM | | | $ 333,500 |
| RTU-2: Classrooms, Media, Admin (NE) Full AC Displacement VAV w/ ERV & DCV | 14,000 CFM | $14.5/CFM | | | $ 203,000 |
| RTU-3: Classrooms, Cafe (SE) Full AC Displacement VAV w/ ERV & DCV | 18,000 CFM | $14.5/CFM | | | $ 261,000 |
| RTU-4: Classrooms, Café, Tech (SW) Full AC Displacement VAV w/ ERV & DCV | 21,000 CFM | $14.5/CFM | | | $ 304,500 |
| RTU-5: Admin.(S) Full AC Displacement VAV w/ ERV & DCV | 6,000 CFM | $14.5/CFM | | | $ 87,000 |
| RTU-6: Gym Dehumid Displacement VAV w/ ERV & DCV | 11,000 CFM | $14.5/CFM | | | $ 159,500 |
| RTU-7: Auditorium, Stage Full AC Displacement VAV w/ ERV & DCV | 11,000 CFM | $14.5/CFM | | | $ 159,500 |
| RTU-8: Lockers 100% O.A. Overhead w/ ERV | 3,000 CFM | $15.5/CFM | | | $ 46,500 |
| MAU-1: Kitchen MAU | 5,500 CFM | $11/CFM | | | $ 60,500 |
| (4) 2,000 MBH High-Efficiency Gas-Fired Condensing Boilers | 4 | $49,000 | | | $ 196,000 |
| Pumps (HHW) including VFD's | 2 | $18,000 | | | $ 36,000 |
| (2) 175 Ton High-Efficiency TurboCor Water-Cooled Chillers Plant and Cooling Towers | 350 tons | $1,500/ton | | | $ 525,000 |
| Pumps (CHW) including VFD's | 2 | $22,500 | | | $ 45,000 |
| Cooling Tower Pumps and VFDs | 2 | $22,500 | | | $ 45,000 |
| Cooling Tower CW Piping | 1 | $30,000 | | | $ 30,000 |
| HHW Piping & Insulation including Terminal Heating Units | | | 150,000 | $5.50 | $ 825,000 |
| CHW Piping & Insulation and Condensate Piping | | | 150,000 | $3.25 | $ 487,500 |
| Ductwork including GRD's, Dampers, & General Exhaust Systems | | | 150,000 | $13.00 | $ 1,950,000 |
| ATC/DDC Controls | | | 150,000 | $5.50 | $ 825,000 |
| Split System Ductless Cooling Units | 3 | $7,500 | | | $ 22,500 |
| Exhaust Fans (Misc. Areas) | | | | | $ 20,000 |
| HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management) | | | 150,000 | $2.5 | $ 375,000 |
| | | | | **TOTAL** | $ 7,326,500 |
| | | | | **TOTAL ($/FT²)** | $ 48.84 |

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules etc.

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| | |
|---|---|
| **PROJECT:** | **Fuller Middle School** |
| **JOB NO:** | **68001500** |
| **CLIENT:** | **Jonathan Levi Architects, Inc.** |
| **DATE:** | **7/26/2018** |
| **BY:** | **KL** |

**Option 2a - Static Plate Energy Recovery VAV Full AC Displacement Ventilation Systems**

| ITEM OF WORK | NO. | UNIT PRICE | AREA | PRICE/S.F. | TOTAL |
|---|---|---|---|---|---|
| AC Displacement Diffuser Assemblies | 78 | $1,150 | | | $ 89,700 |
| Small Displacement Diffuser Assemblies (Admin.) | 51 | $850 | | | $ 43,350 |
| Large AC Displacement Diffuser Assemblies | 31 | $1,150 | | | $ 35,650 |
| VAV Box with Demand Ventilation Controls | 134 | $1,200 | | | $ 160,800 |
| RTU-1: Classrooms, Band, Stage (NW) Full AC Displacement VAV w/ Static Plate ERV & DCV | 23,000 CFM | $15/CFM | | | $ 345,000 |
| RTU-2: Classrooms, Media, Admin (NE) Full AC Displacement VAV w/ Static Plate ERV & DCV | 14,000 CFM | $15/CFM | | | $ 210,000 |
| RTU-3: Classrooms, Cafe (SE) Full AC Displacement VAV w/ Static Plate ERV & DCV | 18,000 CFM | $15/CFM | | | $ 270,000 |
| RTU-4: Classrooms, Café, Tech (SW) Full AC Displacement VAV w/ Static Plate ERV & DCV | 21,000 CFM | $15/CFM | | | $ 315,000 |
| RTU-5: Admin.(S) Full AC Displacement VAV w/ Static Plate ERV & DCV | 6,000 CFM | $15/CFM | | | $ 90,000 |
| RTU-6: Gym Dehumid Displacement VAV w/ Static Plate ERV & DCV | 11,000 CFM | $15/CFM | | | $ 165,000 |
| RTU-7: Auditorium, Stage Full AC Displacement VAV w/ Static Plate ERV & DCV | 11,000 CFM | $15/CFM | | | $ 165,000 |
| RTU-8: Lockers 100% O.A. Overhead w/ Static Plate ERV | 3,000 CFM | $16/CFM | | | $ 48,000 |
| MAU-1: Kitchen MAU | 5,500 CFM | $11/CFM | | | $ 60,500 |
| (4) 2,000 MBH High-Efficiency Gas-Fired Condensing Boilers | 4 | $49,000 | | | $ 196,000 |
| Pumps (HHW) including VFD's | 2 | $18,000 | | | $ 36,000 |
| (2) 175 Ton High-Efficiency TurboCor Water-Cooled Chillers Plant and Cooling Towers | 350 tons | $1,500/ton | | | $ 525,000 |
| Pumps (CHW) including VFD's | 2 | $22,500 | | | $ 45,000 |
| Cooling Tower Pumps and VFDs | 2 | $22,500 | | | $ 45,000 |
| Cooling Tower CW Piping | 1 | $30,000 | | | $ 30,000 |
| HHW Piping & Insulation including Terminal Heating Units | | | 150,000 | $5.50 | $ 825,000 |
| CHW Piping & Insulation and Condensate Piping | | | 150,000 | $3.25 | $ 487,500 |
| Ductwork including GRD's, Dampers, & General Exhaust Systems | | | 150,000 | $13.00 | $ 1,950,000 |
| ATC/DDC Controls | | | 150,000 | $5.50 | $ 825,000 |
| Split System Ductless Cooling Units | 3 | $7,500 | | | $ 22,500 |
| Exhaust Fans (Misc. Areas) | | | | | $ 20,000 |
| HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management) | | | 150,000 | $2.5 | $ 375,000 |
| | | | | **TOTAL** | $ 7,380,000 |
| | | | | **TOTAL ($/FT²)** | $ 49.20 |

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules etc.

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**PROJECT:** Fuller Middle School
**JOB NO:** 68001500
**CLIENT:** Jonathan Levi Architects, Inc.
**DATE:** 7/26/2018 **BY:** KL

**Option 2b - Air-Cooled Chiller Static Plate Energy Recovery VAV Full AC Displacement Ventilation Systems**

| ITEM OF WORK | NO. | UNIT PRICE | AREA | PRICE/S.F. | TOTAL |
|---|---|---|---|---|---|
| AC Displacement Diffuser Assemblies | 78 | $1,150 | | | $ 89,700 |
| Small Displacement Diffuser Assemblies (Admin.) | 51 | $850 | | | $ 43,350 |
| Large AC Displacement Diffuser Assemblies | 31 | $1,150 | | | $ 35,650 |
| VAV Box with Demand Ventilation Controls | 134 | $1,200 | | | $ 160,800 |
| RTU-1: Classrooms, Band, Stage (NW) Full AC Displacement VAV w/ Static Plate ERV & DCV | 23,000 CFM | $15/CFM | | | $ 345,000 |
| RTU-2: Classrooms, Media, Admin (NE) Full AC Displacement VAV w/ Static Plate ERV & DCV | 14,000 CFM | $15/CFM | | | $ 210,000 |
| RTU-3: Classrooms, Cafe (SE) Full AC Displacement VAV w/ Static Plate ERV & DCV | 18,000 CFM | $15/CFM | | | $ 270,000 |
| RTU-4: Classrooms, Café, Tech (SW) Full AC Displacement VAV w/ Static Plate ERV & DCV | 21,000 CFM | $15/CFM | | | $ 315,000 |
| RTU-5: Admin.(S) Full AC Displacement VAV w/ Static Plate ERV & DCV | 6,000 CFM | $15/CFM | | | $ 90,000 |
| RTU-6: Gym Dehumid Displacement VAV w/ Static Plate ERV & DCV | 11,000 CFM | $15/CFM | | | $ 165,000 |
| RTU-7: Auditorium, Stage Full AC Displacement VAV w/ Static Plate ERV & DCV | 11,000 CFM | $15/CFM | | | $ 165,000 |
| RTU-8: Lockers 100% O.A. Overhead w/ Static Plate ERV | 3,000 CFM | $16/CFM | | | $ 48,000 |
| MAU-1: Kitchen MAU | 5,500 CFM | $11/CFM | | | $ 60,500 |
| (4) 2,000 MBH High-Efficiency Gas-Fired Condensing Boilers | 4 | $49,000 | | | $ 196,000 |
| Pumps (HHW) including VFD's | 2 | $18,000 | | | $ 36,000 |
| (2) 175 Ton High-Efficiency TurboCor Air-Cooled Chillers Plant | 350 tons | $1,450/ton | | | $ 507,500 |
| Pumps (CHW) including VFD's | 2 | $22,500 | | | $ 45,000 |
| Exterior CHW Piping | 1 | $30,000 | | | $ 30,000 |
| HHW Piping & Insulation including Terminal Heating Units | | | 150,000 | $5.50 | $ 825,000 |
| CHW Piping & Insulation and Condensate Piping | | | 150,000 | $3.25 | $ 487,500 |
| Ductwork including GRD's, Dampers, & General Exhaust Systems | | | 150,000 | $13.00 | $ 1,950,000 |
| ATC/DDC Controls | | | 150,000 | $5.50 | $ 825,000 |
| Split System Ductless Cooling Units | 3 | $7,500 | | | $ 22,500 |
| Exhaust Fans (Misc. Areas) | | | | | $ 20,000 |
| HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management) | | | 150,000 | $2.5 | $ 375,000 |
| | | | | **TOTAL** | $ 7,317,500 |
| | | | | **TOTAL ($/FT²)** | $ 48.78 |

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules etc.

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| **JOB NO:** | **68001500** |
| **CLIENT:** | **Jonathan Levi Architects, Inc.** |
| **DATE:** | **7/26/2018** **BY: KL** |

**Option 3 - 100% O.A. VAV Displacement Ventilation Systems with Passive Chilled Beam Full AC**

| ITEM OF WORK | NO. | UNIT PRICE | AREA | PRICE/S.F. | TOTAL |
|---|---|---|---|---|---|
| Displacement Diffuser Assemblies | 78 | $950 | | | $ 74,100 |
| Small Displacement Diffuser Assemblies (Admin.) | 51 | $850 | | | $ 43,350 |
| Large AC Displacement Diffuser Assemblies | 31 | $1,150 | | | $ 35,650 |
| VAV Box with Demand Ventilation Controls | 134 | $1,200 | | | $ 160,800 |
| RTU-1: Classrooms, Band, Stage (NW) Displacement VAV w/ ERV & DCV w/ CB Full AC | 17,500 CFM | $14.5/CFM | | | $ 253,750 |
| RTU-2: Classrooms, Media, Admin (NE) Displacement VAV w/ ERV & DCV w/ CB Full AC | 11,000 CFM | $14.5/CFM | | | $ 159,500 |
| RTU-3: Classrooms, Cafe (SE) Displacement VAV w/ ERV & DCV w/ CB Full AC | 15,000 CFM | $14.5/CFM | | | $ 217,500 |
| RTU-4: Classrooms, Café, Tech (SW) Displacement VAV w/ ERV & DCV w/ CB Full AC | 16,000 CFM | $14.5/CFM | | | $ 232,000 |
| RTU-5: Admin.(S) Displacement VAV w/ ERV & DCV w/ CB Full AC | 4,200 CFM | $15.5/CFM | | | $ 65,100 |
| RTU-6: Gym Full AC Displacement VAV w/ ERV & DCV | 11,000 CFM | $14.5/CFM | | | $ 159,500 |
| RTU-7: Auditorium, Stage Full AC Displacement VAV w/ ERV & DCV | 11,000 CFM | $14.5/CFM | | | $ 159,500 |
| RTU-8: Lockers 100% O.A. Overhead w/ ERV | 3,000 CFM | $15.5/CFM | | | $ 46,500 |
| MAU-1: Kitchen MAU | 5,500 CFM | $11/CFM | | | $ 60,500 |
| (4) 2,000 MBH High-Efficiency Gas-Fired Condensing Boilers | 4 | $49,000 | | | $ 196,000 |
| Pumps (HHW) including VFD's | 2 | $18,000 | | | $ 36,000 |
| (2) 175 Ton High-Efficiency TurboCor Water-Cooled Chillers Plant and Cooling Towers | 350 tons | $1,500/ton | | | $ 525,000 |
| Pumps (CHW) including VFD's | 2 | $22,500 | | | $ 45,000 |
| Cooling Tower Pumps and VFDs | 2 | $22,500 | | | $ 45,000 |
| Cooling Tower CW Piping | 1 | $30,000 | | | $ 30,000 |
| HHW Piping & Insulation including Terminal Heating Units | | | 150,000 | $5.50 | $ 825,000 |
| Additional Passive Radiant Heating/Cooling Panels | | | | | $ 75,000 |
| CHW Piping & Insulation and Condensate Piping including Terminal Cooling Units (upcharge to radiant heating panels) | | | 150,000 | $6.25 | $ 937,500 |
| Ductwork including GRD's, Dampers, & General Exhaust Systems | | | 150,000 | $10.25 | $ 1,537,500 |
| ATC/DDC Controls | | | 150,000 | $6.25 | $ 937,500 |
| Split System Ductless Cooling Units | 3 | $7,500 | | | $ 22,500 |
| Exhaust Fans (Misc. Areas) | | | | | $ 20,000 |
| HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management) | | | 150,000 | $2.5 | $ 375,000 |
| | | | | **TOTAL** | $ 7,274,750 |
| | | | | **TOTAL ($/FT²)** | $ 48.50 |

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules etc.

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| | |
|---|---|
| **PROJECT:** | **Fuller Middle School** |
| **JOB NO:** | **68001500** |
| **CLIENT:** | **Jonathan Levi Architects, Inc.** |
| **DATE:** | **7/26/2018** **BY: KL** |

**Option 3a - Static Plate Energy Recovery 100% O.A. VAV Displacement Ventilation Systems with Passive Chilled Beam Full AC**

| ITEM OF WORK | NO. | UNIT PRICE | AREA | PRICE/S.F. | TOTAL |
|---|---|---|---|---|---|
| Displacement Diffuser Assemblies | 78 | $950 | | | $ 74,100 |
| Small Displacement Diffuser Assemblies (Admin.) | 51 | $850 | | | $ 43,350 |
| Large AC Displacement Diffuser Assemblies | 31 | $1,150 | | | $ 35,650 |
| VAV Box with Demand Ventilation Controls | 134 | $1,200 | | | $ 160,800 |
| RTU-1: Classrooms, Band, Stage (NW) Displacement VAV w/ Static Plate ERV & DCV w/ CB Full AC | 17,500 CFM | $15/CFM | | | $ 262,500 |
| RTU-2: Classrooms, Media, Admin (NE) Displacement VAV w/ Static Plate ERV & DCV w/ CB Full AC | 11,000 CFM | $15/CFM | | | $ 165,000 |
| RTU-3: Classrooms, Cafe (SE) Displacement VAV w/ Static Plate ERV & DCV w/ CB Full AC | 15,000 CFM | $15/CFM | | | $ 225,000 |
| RTU-4: Classrooms, Café, Tech (SW) Displacement VAV w/ Static Plate ERV & DCV w/ CB Full AC | 16,000 CFM | $15/CFM | | | $ 240,000 |
| RTU-5: Admin.(S) Displacement VAV w/ Static Plate ERV & DCV w/ CB Full AC | 4,200 CFM | $16/CFM | | | $ 67,200 |
| RTU-6: Gym Full AC Displacement VAV w/ Static Plate ERV & DCV | 11,000 CFM | $15/CFM | | | $ 165,000 |
| RTU-7: Auditorium, Stage Full AC Displacement VAV w/ Static Plate ERV & DCV | 11,000 CFM | $15/CFM | | | $ 165,000 |
| RTU-8: Lockers 100% O.A. Overhead w/ Static Plate ERV | 3,000 CFM | $16/CFM | | | $ 48,000 |
| MAU-1: Kitchen MAU | 5,500 CFM | $11/CFM | | | $ 60,500 |
| (4) 2,000 MBH High-Efficiency Gas-Fired Condensing Boilers | 4 | $49,000 | | | $ 196,000 |
| Pumps (HHW) including VFD's | 2 | $18,000 | | | $ 36,000 |
| (2) 175 Ton High-Efficiency TurboCor Water-Cooled Chillers Plant and Cooling Towers | 350 tons | $1,500/ton | | | $ 525,000 |
| Pumps (CHW) including VFD's | 2 | $22,500 | | | $ 45,000 |
| Cooling Tower Pumps and VFDs | 2 | $22,500 | | | $ 45,000 |
| Cooling Tower CW Piping | 1 | $30,000 | | | $ 30,000 |
| HHW Piping & Insulation including Terminal Heating Units | | | 150,000 | $5.50 | $ 825,000 |
| Additional Passive Radiant Heating/Cooling Panels | | | | | $ 75,000 |
| CHW Piping & Insulation and Condensate Piping including Terminal Cooling Units (upcharge to radiant heating panels) | | | 150,000 | $6.25 | $ 937,500 |
| Ductwork including GRD's, Dampers, & General Exhaust Systems | | | 150,000 | $10.25 | $ 1,537,500 |
| ATC/DDC Controls | | | 150,000 | $6.25 | $ 937,500 |
| Split System Ductless Cooling Units | 3 | $7,500 | | | $ 22,500 |
| Exhaust Fans (Misc. Areas) | | | | | $ 20,000 |
| HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management) | | | 150,000 | $2.5 | $ 375,000 |
| | | | | **TOTAL** | $ 7,319,100 |
| | | | | **TOTAL ($/FT²)** | $ 48.79 |

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules etc.

GARCIA • GALUSKA • DESOUSA
Consulting Engineers Inc.
370 Faunce Corner Road, Dartmouth, MA 02747-1217

| | | | |
|---|---|---|---|
| **PROJECT:** | **Fuller Middle School** | | |
| **JOB NO:** | **68001500** | | |
| **CLIENT:** | **Jonathan Levi Architects, Inc.** | | |
| **DATE:** | **7/26/2018** | **BY:** | **KL** |

**Option 3b - Air-Cooled Chiller Static Plate Energy Recovery 100% O.A. VAV Displacement Ventilation Systems with Passive Chilled Beam Full AC**

| ITEM OF WORK | NO. | UNIT PRICE | AREA | PRICE/S.F. | TOTAL |
|---|---|---|---|---|---|
| Displacement Diffuser Assemblies | 78 | $950 | | | $ 74,100 |
| Small Displacement Diffuser Assemblies (Admin.) | 51 | $850 | | | $ 43,350 |
| Large AC Displacement Diffuser Assemblies | 31 | $1,150 | | | $ 35,650 |
| VAV Box with Demand Ventilation Controls | 134 | $1,200 | | | $ 160,800 |
| RTU-1: Classrooms, Band, Stage (NW) Displacement VAV w/ Static Plate ERV & DCV w/ CB Full AC | 17,500 CFM | $15/CFM | | | $ 262,500 |
| RTU-2: Classrooms, Media, Admin (NE) Displacement VAV w/ Static Plate ERV & DCV w/ CB Full AC | 11,000 CFM | $15/CFM | | | $ 165,000 |
| RTU-3: Classrooms, Cafe (SE) Displacement VAV w/ Static Plate ERV & DCV w/ CB Full AC | 15,000 CFM | $15/CFM | | | $ 225,000 |
| RTU-4: Classrooms, Café, Tech (SW) Displacement VAV w/ Static Plate ERV & DCV w/ CB Full AC | 16,000 CFM | $15/CFM | | | $ 240,000 |
| RTU-5: Admin.(S) Displacement VAV w/ Static Plate ERV & DCV w/ CB Full AC | 4,200 CFM | $16/CFM | | | $ 67,200 |
| RTU-6: Gym Full AC Displacement VAV w/ Static Plate ERV & DCV | 11,000 CFM | $15/CFM | | | $ 165,000 |
| RTU-7: Auditorium, Stage Full AC Displacement VAV w/ Static Plate ERV & DCV | 11,000 CFM | $15/CFM | | | $ 165,000 |
| RTU-8: Lockers 100% O.A. Overhead w/ Static Plate ERV | 3,000 CFM | $16/CFM | | | $ 48,000 |
| MAU-1: Kitchen MAU | 5,500 CFM | $11/CFM | | | $ 60,500 |
| (4) 2,000 MBH High-Efficiency Gas-Fired Condensing Boilers | 4 | $49,000 | | | $ 196,000 |
| Pumps (HHW) including VFD's | 2 | $18,000 | | | $ 36,000 |
| (2) 175 Ton High-Efficiency TurboCor Air-Cooled Chillers Plant | 350 tons | $1,450/ton | | | $ 507,500 |
| Pumps (CHW) including VFD's | 2 | $22,500 | | | $ 45,000 |
| Exterior CHW Piping | 1 | $30,000 | | | $ 30,000 |
| HHW Piping & Insulation including Terminal Heating Units | | | 150,000 | $5.50 | $ 825,000 |
| Additional Passive Radiant Heating/Cooling Panels | | | | | $ 75,000 |
| CHW Piping & Insulation and Condensate Piping including Terminal Cooling Units (upcharge to radiant heating panels) | | | 150,000 | $6.25 | $ 937,500 |
| Ductwork including GRD's, Dampers, & General Exhaust Systems | | | 150,000 | $10.25 | $ 1,537,500 |
| ATC/DDC Controls | | | 150,000 | $6.25 | $ 937,500 |
| Split System Ductless Cooling Units | 3 | $7,500 | | | $ 22,500 |
| Exhaust Fans (Misc. Areas) | | | | | $ 20,000 |
| HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management) | | | 150,000 | $2.5 | $ 375,000 |
| | | | | **TOTAL** | $ 7,256,600 |
| | | | | **TOTAL ($/FT²)** | $ 48.38 |

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules etc.

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Consulting Engineers Inc.
370 Faunce Corner Road, Dartmouth, MA 02747-1217

| | |
|---|---|
| PROJECT: | Fuller Middle School |
| JOB NO: | 68001500 |
| CLIENT: | Jonathan Levi Architects, Inc. |
| DATE: | 7/26/2018 BY: KL |

**Option 4 - Geothermal Plant Static Plate Energy Recovery VAV Full AC Displacement Ventilation Systems**

| ITEM OF WORK | NO. | UNIT PRICE | AREA | PRICE/S.F. | TOTAL |
|---|---|---|---|---|---|
| AC Displacement Diffuser Assemblies | 78 | $1,150 | | | $ 89,700 |
| Small Displacement Diffuser Assemblies (Admin.) | 51 | $850 | | | $ 43,350 |
| Large AC Displacement Diffuser Assemblies | 31 | $1,150 | | | $ 35,650 |
| VAV Box with Demand Ventilation Controls | 134 | $1,200 | | | $ 160,800 |
| RTU-1: Classrooms, Band, Stage (NW) Full AC Displacement VAV w/ Static Plate ERV & DCV | 23,000 CFM | $15/CFM | | | $ 345,000 |
| RTU-2: Classrooms, Media, Admin (NE) Full AC Displacement VAV w/ Static Plate ERV & DCV | 14,000 CFM | $15/CFM | | | $ 210,000 |
| RTU-3: Classrooms, Cafe (SE) Full AC Displacement VAV w/ Static Plate ERV & DCV | 18,000 CFM | $15/CFM | | | $ 270,000 |
| RTU-4: Classrooms, Café, Tech (SW) Full AC Displacement VAV w/ Static Plate ERV & DCV | 21,000 CFM | $15/CFM | | | $ 315,000 |
| RTU-5: Admin.(S) Full AC Displacement VAV w/ Static Plate ERV & DCV | 6,000 CFM | $15/CFM | | | $ 90,000 |
| RTU-6: Gym Dehumid Displacement VAV w/ Static Plate ERV & DCV | 11,000 CFM | $15/CFM | | | $ 165,000 |
| RTU-7: Auditorium, Stage Full AC Displacement VAV w/ Static Plate ERV & DCV | 11,000 CFM | $15/CFM | | | $ 165,000 |
| RTU-8: Lockers 100% O.A. Overhead w/ Static Plate ERV | 3,000 CFM | $16/CFM | | | $ 48,000 |
| MAU-1: Kitchen MAU | 5,500 CFM | $11/CFM | | | $ 60,500 |
| (2) 2,000 MBH High-Efficiency Gas-Fired Condensing Boilers | 2 | $49,000 | | | $ 98,000 |
| Pumps (HHW) including VFD's | 2 | $18,000 | | | $ 36,000 |
| High-Efficiency Water-to-Water Source Heat Pump Chiller Plant | 350 tons | $1,250/ton | | | $ 437,500 |
| Geothermal System Glycol Feed & Water Treatment System | 1 | $30,000 | | | $ 30,000 |
| Pumps (CHW) including VFD's | 2 | $22,500 | | | $ 45,000 |
| Pumps (Geo) including VFD's | 2 | $22,500 | | | $ 45,000 |
| Geothermal CW Piping Mains | 1 | $50,000 | | | $ 50,000 |
| 500' Deep Closed Loop Geothermal Wells (350 Tons total capacity) including Underground Piping, Coring, Sleeves, etc | 140 | $20,000 | | | $ 2,800,000 |
| HHW Piping & Insulation including Terminal Heating Units | | | 150,000 | $5.50 | $ 825,000 |
| CHW Piping & Insulation and Condensate Piping | | | 150,000 | $3.25 | $ 487,500 |
| Ductwork including GRD's, Dampers, & General Exhaust Systems | | | 150,000 | $13.00 | $ 1,950,000 |
| ATC/DDC Controls | | | 150,000 | $6.00 | $ 900,000 |
| Split System Ductless Cooling Units | 3 | $7,500 | | | $ 22,500 |
| Exhaust Fans (Misc. Areas) | | | | | $ 20,000 |
| HVAC General Conditions (as-builts, coordination, shop drawings, testing and balancing, Cx support, Project Management) | | | 150,000 | $2.5 | $ 375,000 |
| | | | | TOTAL | $ 10,119,500 |
| | | | | TOTAL ($/FT²) | $ 67.46 |

Cost estimates have been derived for system comparison purposes only. Estimates do not necessarily include HVAC systems and equipment that would typically be required for all system options studied; example: supplemental cooling systems for elevator machine rooms, tel/data rooms, etc. and radiation heating for unoccupied areas such as storage rooms, corridors, vestibules etc.

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Consulting Engineers Inc.
370 Faunce Corner Road, Dartmouth, MA 02747-1217

**Fuller Middle School - Annual Maintenance Costs**

**Baseline - VAV**

| Unit Type | Quantity | Cost/Unit | Annual Cost |
|---|---|---|---|
| VAV Box w/ Reheat Coil | 147 | $75 | $11,025 |
| Large CHW RTU's | 7 | $2,000 | $14,000 |
| Small CHW RTU's | 1 | $1,500 | $1,500 |
| MAU's | 1 | $1,200 | $1,200 |
| Boiler Plant | 1 | $1,000 | $1,000 |
| Chiller Plant w/ Cooling Tower | 1 | $2,500 | $2,500 |
| | | **TOTAL** | **$31,225** |

**Option 1 - High-Efficiency VAV**

| Unit Type | Quantity | Cost/Unit | Annual Cost |
|---|---|---|---|
| VAV Box w/ Reheat Coil | 147 | $75 | $11,025 |
| Large CHW RTU's | 7 | $2,000 | $14,000 |
| Small CHW RTU's | 1 | $1,500 | $1,500 |
| MAU's | 1 | $1,200 | $1,200 |
| Boiler Plant | 1 | $1,000 | $1,000 |
| Chiller Plant w/ Cooling Tower | 1 | $2,500 | $2,500 |
| | | **TOTAL** | **$31,225** |

**Option 2 - Full AC Displacement**

| Unit Type | Quantity | Cost/Unit | Annual Cost |
|---|---|---|---|
| VAV Box | 134 | $50 | $6,700 |
| Large CHW RTU's | 7 | $2,000 | $14,000 |
| Small CHW RTU's | 1 | $1,500 | $1,500 |
| MAU's | 1 | $1,200 | $1,200 |
| Boiler Plant | 1 | $1,000 | $1,000 |
| Chiller Plant w/ Cooling Tower | 1 | $2,500 | $2,500 |
| | | **TOTAL** | **$26,900** |

**Option 2a - Static Plate ERV Full AC Displacement**

| Unit Type | Quantity | Cost/Unit | Annual Cost |
|---|---|---|---|
| VAV Box | 134 | $50 | $6,700 |
| Large CHW RTU's (static plate) | 7 | $1,750 | $12,250 |
| Small CHW RTU's (static plate) | 1 | $1,250 | $1,250 |
| MAU's | 1 | $1,200 | $1,200 |
| Boiler Plant | 1 | $1,000 | $1,000 |
| Chiller Plant w/ Cooling Tower | 1 | $2,500 | $2,500 |
| | | **TOTAL** | **$24,900** |

**Option 2b - Static Plate ERV & Air-Cooled Chiller Full AC Displacement**

| Unit Type | Quantity | Cost/Unit | Annual Cost |
|---|---|---|---|
| VAV Box | 134 | $50 | $6,700 |
| Large CHW RTU's (static plate) | 7 | $1,750 | $12,250 |
| Small CHW RTU's (static plate) | 1 | $1,250 | $1,250 |
| MAU's | 1 | $1,200 | $1,200 |
| Boiler Plant | 1 | $1,000 | $1,000 |
| Air-Cooled Chiller Plant | 1 | $1,300 | $1,300 |
| | | **TOTAL** | **$23,700** |

**Option 3 - Displacement w/ Radiant Cooling Full AC**

| Unit Type | Quantity | Cost/Unit | Annual Cost |
|---|---|---|---|
| VAV Box | 134 | $50 | $6,700 |
| CHW Panel & Control Valve | 134 | $25 | $3,350 |
| Large CHW RTU's | 7 | $2,000 | $14,000 |
| Small CHW RTU's | 1 | $1,500 | $1,500 |
| MAU's | 1 | $1,200 | $1,200 |
| Boiler Plant | 1 | $1,000 | $1,000 |
| Chiller Plant w/ Cooling Tower | 1 | $2,500 | $2,500 |
| | | **TOTAL** | **$30,250** |

**Option 3a - Static Plate ERV Displacement w/ Radiant Cooling Full AC**

| Unit Type | Quantity | Cost/Unit | Annual Cost |
|---|---|---|---|
| VAV Box | 134 | $50 | $6,700 |
| CHW Panel & Control Valve | 134 | $25 | $3,350 |
| Large CHW RTU's (static plate) | 7 | $1,750 | $12,250 |
| Small CHW RTU's (static plate) | 1 | $1,250 | $1,250 |
| MAU's | 1 | $1,200 | $1,200 |
| Boiler Plant | 1 | $1,000 | $1,000 |
| Chiller Plant w/ Cooling Tower | 1 | $2,500 | $2,500 |
| | | **TOTAL** | **$28,250** |

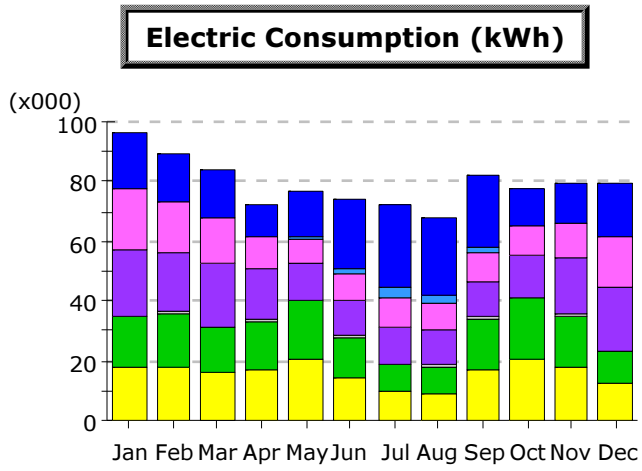
**Option 3b - Static Plate ERV & Air-Cooled Chiller Displacement w/ Radiant Cooling Full AC**

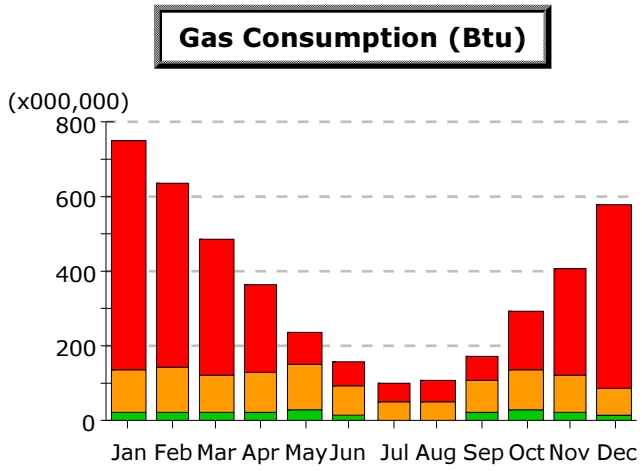
| Unit Type | Quantity | Cost/Unit | Annual Cost |
|---|---|---|---|
| VAV Box | 134 | $50 | $6,700 |
| CHW Panel & Control Valve | 134 | $25 | $3,350 |
| Large CHW RTU's (static plate) | 7 | $1,750 | $12,250 |
| Small CHW RTU's (static plate) | 1 | $1,250 | $1,250 |
| MAU's | 1 | $1,200 | $1,200 |
| Boiler Plant | 1 | $1,000 | $1,000 |
| Air-Cooled Chiller Plant | 1 | $1,300 | $1,300 |
| | | **TOTAL** | **$27,050** |

**Option 4 - Geothermal Static Plate ERV Full AC Displacement**

| Unit Type | Quantity | Cost/Unit | Annual Cost |
|---|---|---|---|
| VAV Box | 134 | $50 | $6,700 |
| Large CHW RTU's (static plate) | 7 | $1,750 | $12,250 |
| Small CHW RTU's (static plate) | 1 | $1,250 | $1,250 |
| MAU's | 1 | $1,200 | $1,200 |
| Boiler Plant | 1 | $1,000 | $1,000 |
| Geothermal Plant | 1 | $3,500 | $3,500 |
| | | **TOTAL** | **$25,900** |

# ENERGY PROFILES





**Electric Consumption (kWh x000)**

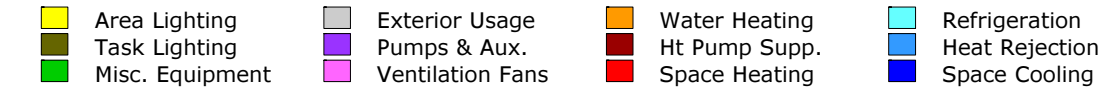
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 18.89 | 15.67 | 16.59 | 11.07 | 15.48 | 23.13 | 27.72 | 25.73 | 23.90 | 12.04 | 12.63 | 17.75 | 220.60 |
| Heat Reject. | 0.00 | 0.00 | 0.01 | 0.01 | 0.56 | 2.02 | 3.30 | 2.74 | 2.31 | 0.18 | 0.03 | 0.01 | 11.18 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 20.96 | 17.66 | 15.34 | 10.98 | 8.35 | 9.09 | 10.40 | 9.25 | 9.59 | 9.50 | 12.12 | 16.88 | 150.12 |
| Pumps & Aux. | 21.62 | 19.59 | 20.81 | 16.89 | 12.22 | 11.87 | 11.94 | 11.66 | 11.91 | 14.28 | 18.45 | 20.97 | 192.23 |
| Ext. Usage | 0.66 | 0.51 | 0.56 | 0.54 | 0.39 | 0.38 | 0.39 | 0.63 | 0.61 | 0.63 | 0.64 | 0.66 | 6.60 |
| Misc. Equip. | 16.76 | 17.46 | 14.78 | 15.98 | 19.43 | 13.57 | 8.82 | 8.63 | 16.59 | 19.96 | 17.08 | 10.66 | 179.72 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 17.65 | 18.26 | 16.21 | 17.09 | 20.41 | 14.38 | 9.66 | 9.32 | 17.40 | 20.72 | 18.13 | 12.27 | 191.51 |
| **Total** | 96.56 | 89.15 | 84.30 | 72.56 | 76.85 | 74.44 | 72.23 | 67.96 | 82.32 | 77.30 | 79.08 | 79.21 | 951.95 |

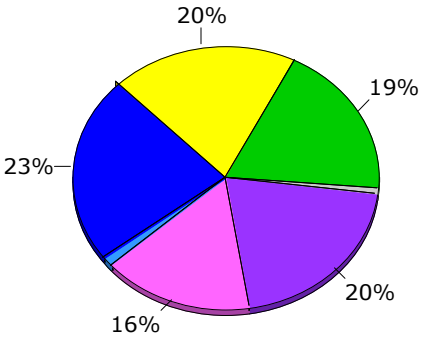
**Gas Consumption (Btu x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 615.2 | 493.3 | 363.6 | 232.9 | 90.8 | 61.8 | 44.4 | 56.7 | 64.7 | 152.6 | 281.9 | 498.8 | 2,956.7 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 114.4 | 120.9 | 101.7 | 109.1 | 120.2 | 81.6 | 53.1 | 49.4 | 87.2 | 108.7 | 98.7 | 70.2 | 1,115.2 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 23.4 | 24.7 | 19.5 | 22.1 | 27.3 | 13.0 | 0.1 | 0.1 | 20.8 | 28.5 | 23.4 | 13.1 | 216.0 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 753.0 | 638.9 | 484.9 | 364.1 | 238.3 | 156.4 | 97.6 | 106.2 | 172.7 | 289.9 | 404.0 | 582.1 | 4,287.9 |

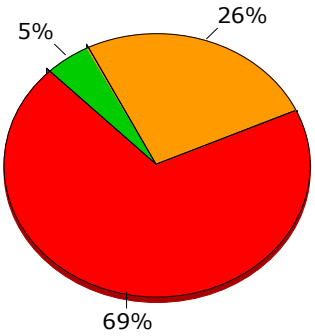
**Annual Energy Consumption by Enduse**

| | Electricity kWh (x000) | Natural Gas MBtu | Steam Btu | Chilled Water Btu |
|---|---|---|---|---|
| Space Cool | 220.60 | - | - | - |
| Heat Reject. | 11.18 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | - | 2,956.7 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 1,115.2 | - | - |
| Vent. Fans | 150.12 | - | - | - |
| Pumps & Aux. | 192.23 | - | - | - |
| Ext. Usage | 6.60 | - | - | - |
| Misc. Equip. | 179.72 | 216.0 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 191.51 | - | - | - |
| **Total** | 951.95 | 4,287.9 | - | - |



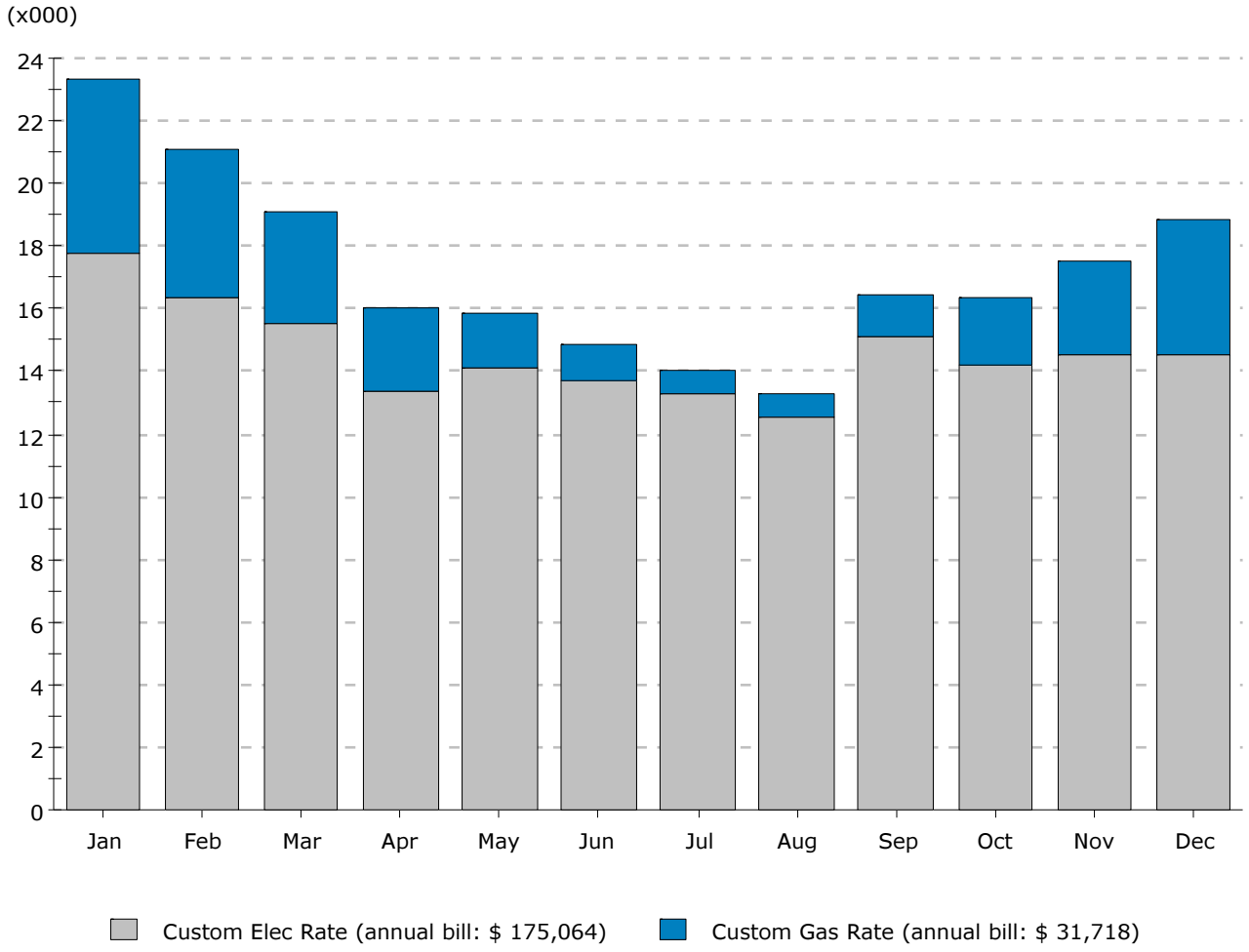




**Electricity**

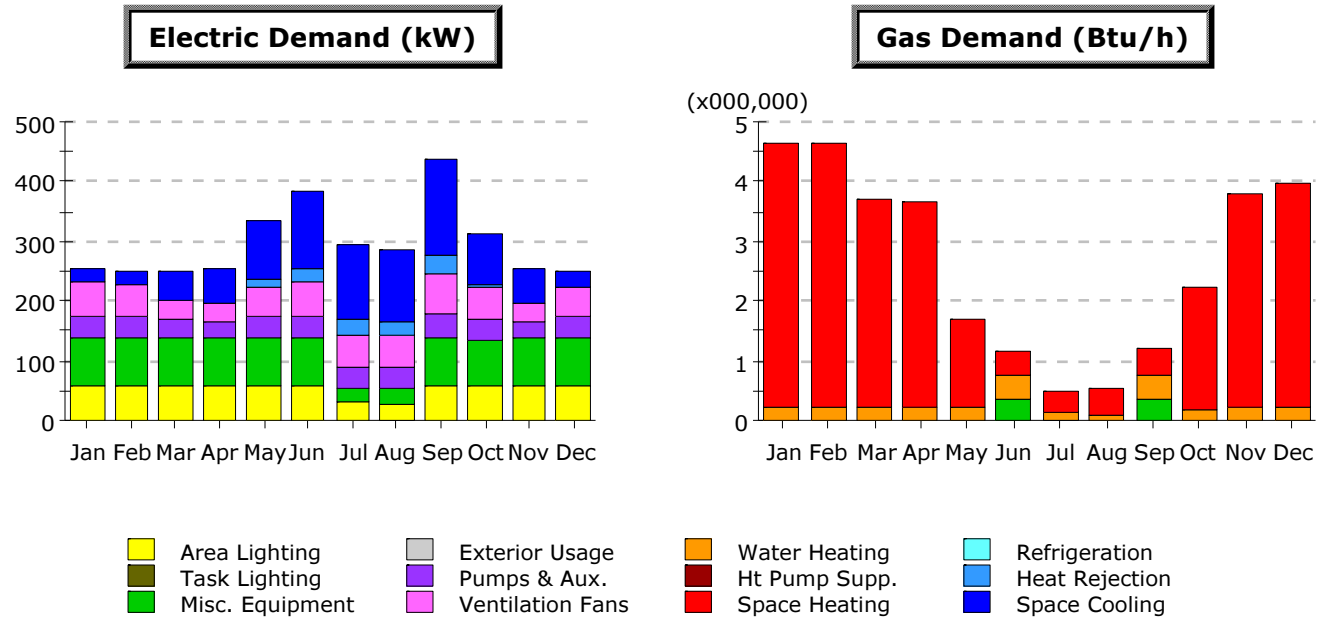



**Natural Gas**

## Monthly Utility Bills ($)




**Total Annual Bill Across All Rates: $ 206,782**




**Electric Demand (kW)**

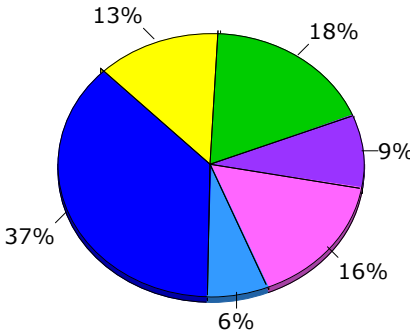
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 21.8 | 22.2 | 48.2 | 56.8 | 97.5 | 128.7 | 126.0 | 120.4 | 163.6 | 82.2 | 60.4 | 24.1 | 951.8 |
| Heat Reject. | - | - | 2.2 | - | 13.2 | 22.0 | 27.6 | 24.0 | 28.3 | 6.0 | 0.4 | - | 123.7 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 58.1 | 56.3 | 29.6 | 30.2 | 52.7 | 59.5 | 51.5 | 53.0 | 69.6 | 52.9 | 28.8 | 51.6 | 593.7 |
| Pumps & Aux. | 32.6 | 32.5 | 30.4 | 28.4 | 35.1 | 37.0 | 38.1 | 37.7 | 38.6 | 33.5 | 28.5 | 32.3 | 404.7 |
| Ext. Usage | - | - | - | - | - | - | - | 0.3 | - | - | - | - | 0.3 |
| Misc. Equip. | 80.8 | 80.8 | 80.8 | 79.7 | 77.8 | 77.8 | 24.3 | 24.3 | 79.7 | 76.8 | 77.8 | 80.8 | 841.4 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 29.1 | 27.1 | 59.2 | 59.2 | 59.2 | 59.2 | 648.3 |
| **Total** | 252.5 | 251.0 | 250.4 | 254.3 | 335.5 | 384.2 | 296.6 | 286.9 | 439.0 | 310.6 | 255.1 | 247.9 | 3,563.9 |

**Gas Demand (Btu/h x000,000)**

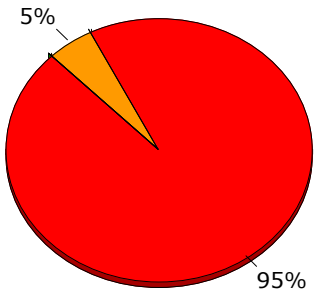
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 4.39 | 4.39 | 3.45 | 3.41 | 1.48 | 0.38 | 0.32 | 0.47 | 0.47 | 2.06 | 3.58 | 3.75 | 28.17 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 0.23 | 0.24 | 0.24 | 0.23 | 0.22 | 0.40 | 0.15 | 0.08 | 0.36 | 0.19 | 0.20 | 0.22 | 2.76 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | - | - | 0.38 | 0.00 | 0.00 | 0.00 | 0.79 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 4.63 | 4.63 | 3.69 | 3.65 | 1.71 | 1.16 | 0.47 | 0.55 | 1.21 | 2.25 | 3.79 | 3.98 | 31.71 |

**Annual Peak Demand by Enduse**

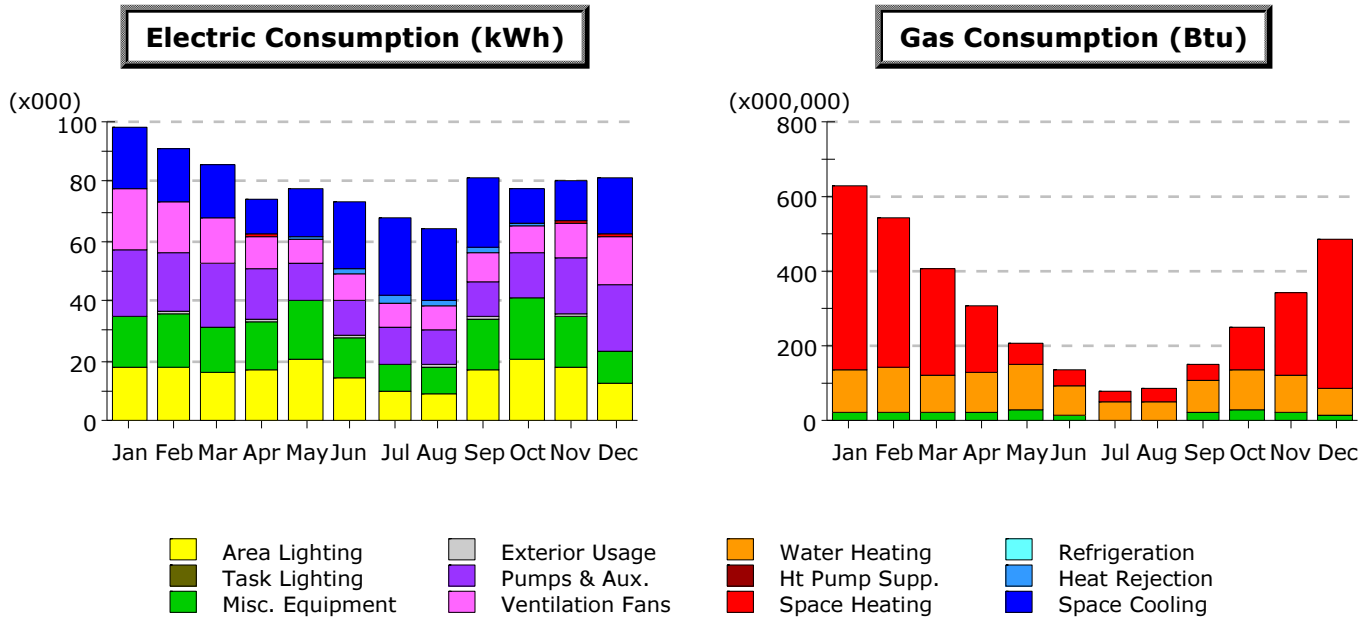
| | Electricity kW | Natural Gas Btu/h (x000) | Steam Btu/h | Chilled Water Btu/h |
|---|---|---|---|---|
| Space Cool | 163.60 | - | - | - |
| Heat Reject. | 28.27 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | - | 4,387.3 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 239.6 | - | - |
| Vent. Fans | 69.61 | - | - | - |
| Pumps & Aux. | 38.57 | - | - | - |
| Ext. Usage | - | - | - | - |
| Misc. Equip. | 79.71 | 3.8 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 59.19 | - | - | - |
| **Total** | 438.96 | 4,630.7 | - | - |


**Electricity**




**Natural Gas**




**Electric Consumption (kWh x000)**

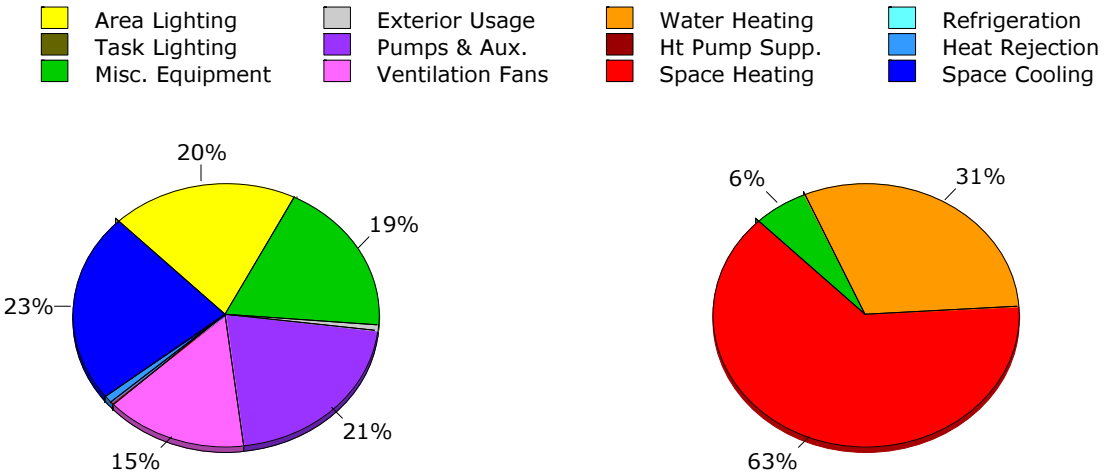
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 20.64 | 17.00 | 17.54 | 11.54 | 15.68 | 22.49 | 25.43 | 24.00 | 22.96 | 12.30 | 13.25 | 19.35 | 222.17 |
| Heat Reject. | 0.02 | 0.02 | 0.01 | 0.01 | 0.60 | 1.78 | 2.63 | 2.19 | 2.14 | 0.20 | 0.03 | 0.02 | 9.65 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 0.49 | 0.40 | 0.34 | 0.22 | 0.11 | 0.09 | 0.08 | 0.09 | 0.09 | 0.15 | 0.25 | 0.40 | 2.69 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 19.96 | 16.75 | 14.88 | 10.97 | 8.19 | 8.19 | 8.20 | 7.51 | 9.09 | 9.33 | 11.57 | 16.76 | 141.41 |
| Pumps & Aux. | 22.31 | 20.25 | 21.38 | 17.37 | 12.50 | 12.17 | 12.25 | 11.96 | 12.18 | 14.66 | 18.97 | 21.57 | 197.58 |
| Ext. Usage | 0.66 | 0.51 | 0.56 | 0.54 | 0.39 | 0.38 | 0.39 | 0.63 | 0.61 | 0.63 | 0.64 | 0.66 | 6.60 |
| Misc. Equip. | 16.76 | 17.46 | 14.78 | 15.98 | 19.43 | 13.57 | 8.82 | 8.63 | 16.59 | 19.96 | 17.08 | 10.66 | 179.72 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 17.65 | 18.26 | 16.21 | 17.09 | 20.41 | 14.38 | 9.66 | 9.32 | 17.40 | 20.72 | 18.13 | 12.27 | 191.51 |
| **Total** | 98.51 | 90.65 | 85.70 | 73.71 | 77.30 | 73.05 | 67.45 | 64.32 | 81.07 | 77.95 | 79.92 | 81.69 | 951.32 |

**Gas Consumption (Btu x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 489.8 | 397.5 | 284.5 | 176.3 | 61.1 | 39.2 | 25.8 | 36.2 | 40.9 | 109.7 | 220.3 | 400.2 | 2,281.4 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 114.4 | 120.9 | 101.7 | 109.1 | 120.2 | 81.6 | 53.1 | 49.4 | 87.2 | 108.7 | 98.7 | 70.2 | 1,115.2 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 23.4 | 24.7 | 19.5 | 22.1 | 27.3 | 13.0 | 0.1 | 0.1 | 20.8 | 28.5 | 23.4 | 13.1 | 216.0 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 627.6 | 543.1 | 405.7 | 307.5 | 208.5 | 133.8 | 79.0 | 85.6 | 148.9 | 247.0 | 342.4 | 483.5 | 3,612.6 |

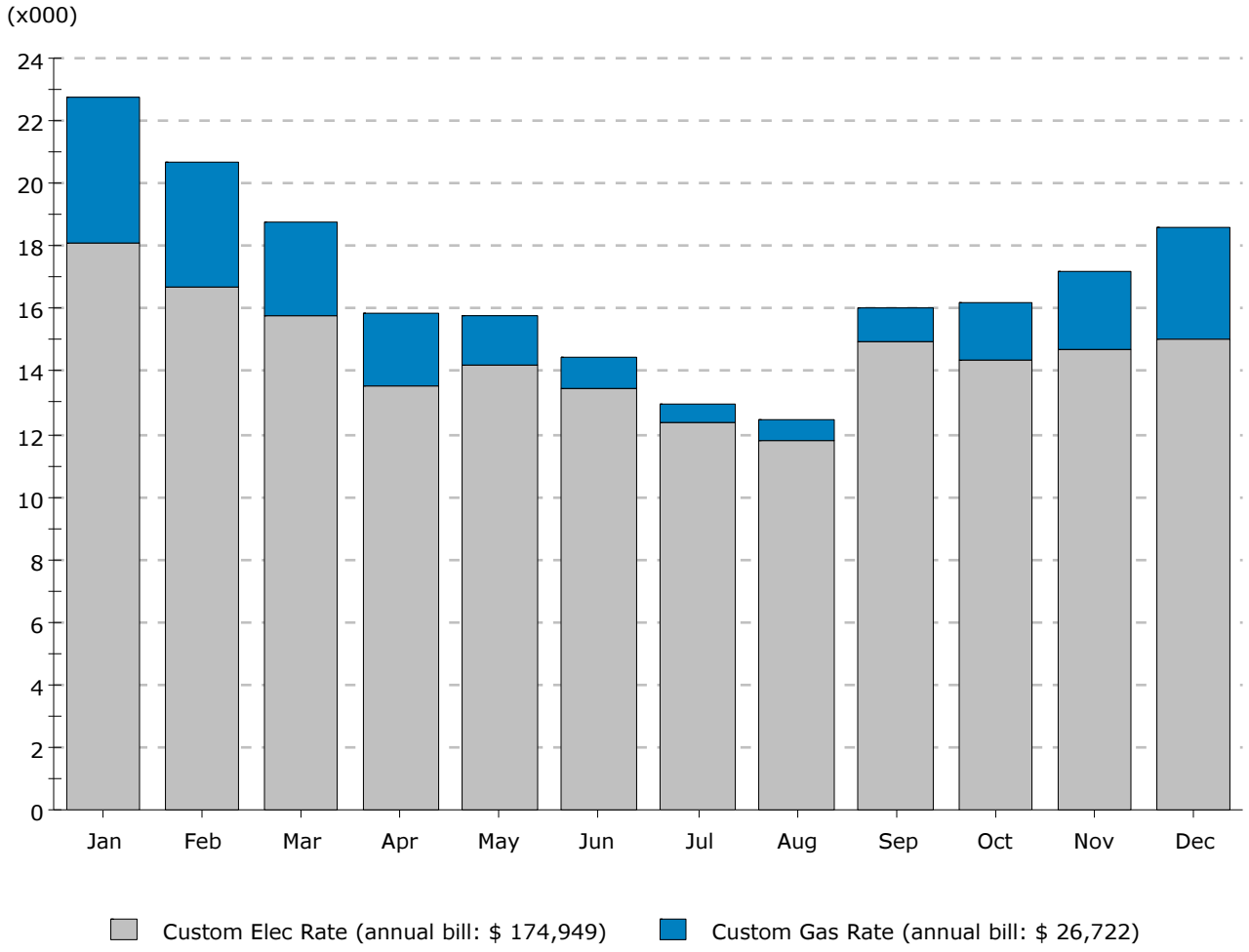
**Annual Energy Consumption by Enduse**

| | Electricity kWh (x000) | Natural Gas MBtu | Steam Btu | Chilled Water Btu |
|---|---|---|---|---|
| Space Cool | 222.17 | - | - | - |
| Heat Reject. | 9.65 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 2.69 | 2,281.4 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 1,115.2 | - | - |
| Vent. Fans | 141.41 | - | - | - |
| Pumps & Aux. | 197.58 | - | - | - |
| Ext. Usage | 6.60 | - | - | - |
| Misc. Equip. | 179.72 | 216.0 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 191.51 | - | - | - |
| **Total** | 951.32 | 3,612.6 | - | - |

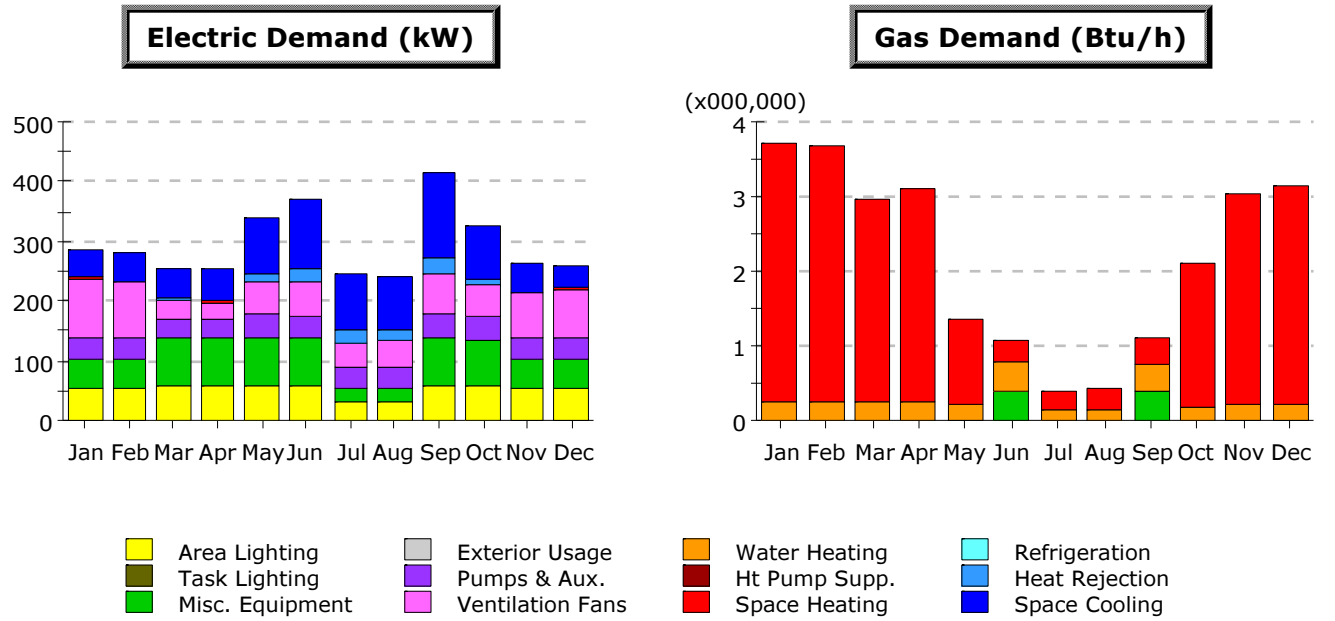



**Electricity** **Natural Gas**

## Monthly Utility Bills ($)




**Total Annual Bill Across All Rates: $ 201,671**




**Electric Demand (kW)**

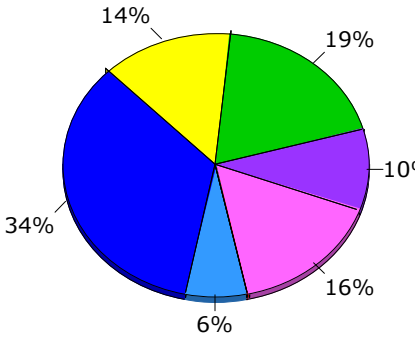
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 44.9 | 46.4 | 49.0 | 57.9 | 98.0 | 117.1 | 93.6 | 92.3 | 143.5 | 89.8 | 49.2 | 39.5 | 921.2 |
| Heat Reject. | - | - | 2.1 | - | 10.7 | 20.8 | 22.1 | 17.5 | 26.9 | 8.3 | - | - | 108.4 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 2.6 | 2.6 | 0.6 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.4 | 1.9 | 2.2 | 12.6 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 98.2 | 92.1 | 29.6 | 30.2 | 55.8 | 55.5 | 39.4 | 41.4 | 66.3 | 53.6 | 73.3 | 80.4 | 715.8 |
| Pumps & Aux. | 35.0 | 35.0 | 31.4 | 29.2 | 36.6 | 38.9 | 38.1 | 37.7 | 40.6 | 36.3 | 35.2 | 34.8 | 428.8 |
| Ext. Usage | - | - | - | - | - | - | - | 0.3 | - | - | - | - | 0.3 |
| Misc. Equip. | 49.9 | 49.9 | 80.8 | 79.7 | 80.8 | 77.8 | 24.3 | 24.3 | 79.7 | 76.8 | 51.0 | 49.9 | 724.9 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 53.8 | 53.8 | 59.2 | 59.2 | 59.2 | 59.2 | 29.1 | 29.1 | 59.2 | 59.2 | 53.8 | 53.8 | 628.6 |
| **Total** | 284.5 | 279.9 | 252.7 | 256.6 | 341.5 | 369.7 | 247.0 | 242.9 | 416.5 | 324.4 | 264.5 | 260.5 | 3,540.6 |

**Gas Demand (Btu/h x000,000)**

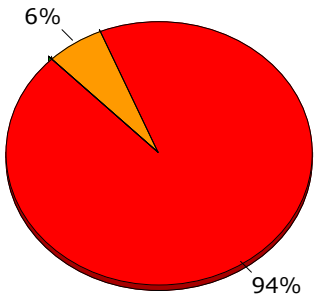
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 3.48 | 3.44 | 2.72 | 2.87 | 1.14 | 0.28 | 0.23 | 0.28 | 0.35 | 1.92 | 2.82 | 2.92 | 22.45 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 0.23 | 0.24 | 0.24 | 0.23 | 0.22 | 0.40 | 0.15 | 0.15 | 0.36 | 0.19 | 0.20 | 0.22 | 2.83 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | - | - | 0.38 | 0.00 | 0.00 | 0.00 | 0.79 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 3.72 | 3.69 | 2.96 | 3.11 | 1.37 | 1.06 | 0.38 | 0.43 | 1.09 | 2.11 | 3.02 | 3.14 | 26.06 |

**Annual Peak Demand by Enduse**

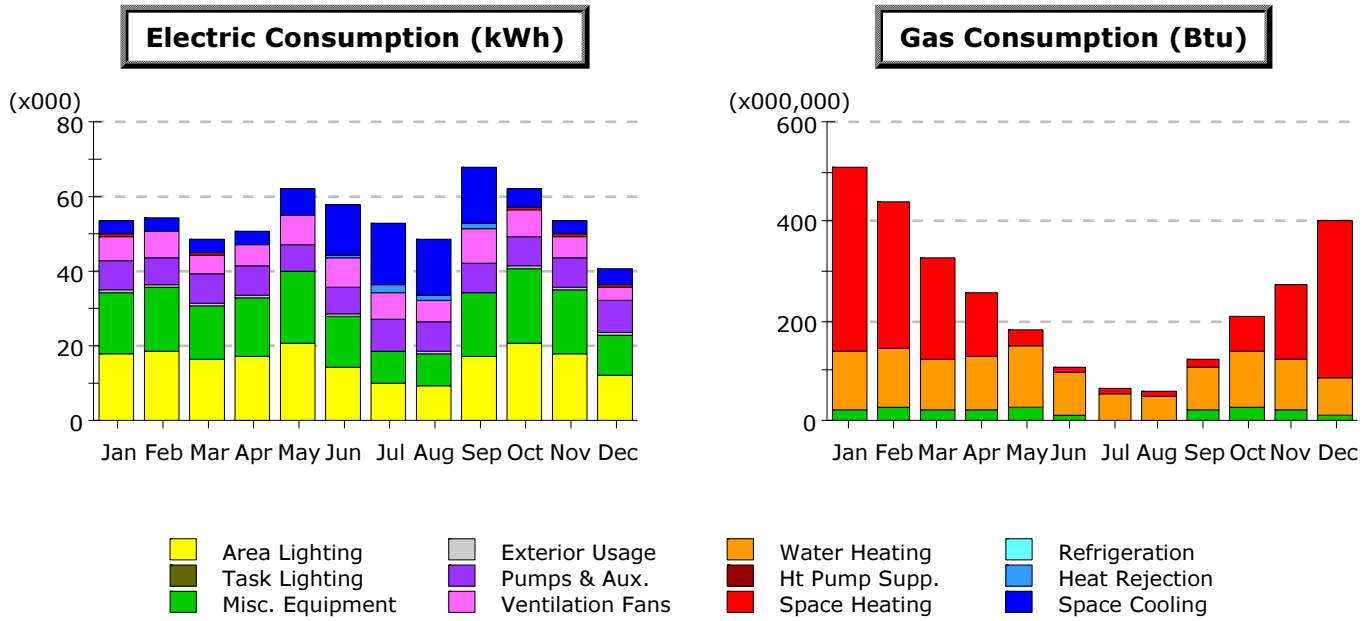
| | Electricity kW | Natural Gas Btu/h (x000) | Steam Btu/h | Chilled Water Btu/h |
|---|---|---|---|---|
| Space Cool | 143.49 | - | - | - |
| Heat Reject. | 26.89 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 0.34 | 3,480.2 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 232.0 | - | - |
| Vent. Fans | 66.32 | - | - | - |
| Pumps & Aux. | 40.57 | - | - | - |
| Ext. Usage | - | - | - | - |
| Misc. Equip. | 79.71 | 3.8 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 59.19 | - | - | - |
| **Total** | 416.51 | 3,716.0 | - | - |


**Electricity**




**Natural Gas**




**Electric Consumption (kWh x000)**

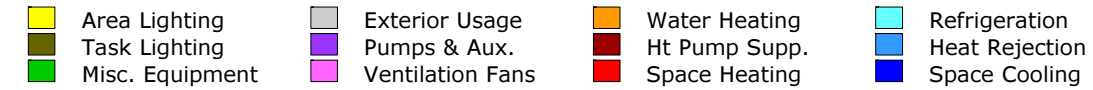
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 3.55 | 3.19 | 3.35 | 3.52 | 7.37 | 13.10 | 16.57 | 14.65 | 14.62 | 4.80 | 3.38 | 3.86 | 91.97 |
| Heat Reject. | 0.00 | 0.00 | - | 0.01 | 0.29 | 1.13 | 2.02 | 1.60 | 1.48 | 0.10 | 0.01 | 0.00 | 6.65 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 0.56 | 0.45 | 0.39 | 0.29 | 0.10 | 0.04 | 0.03 | 0.03 | 0.05 | 0.17 | 0.28 | 0.51 | 2.92 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 6.37 | 6.58 | 5.35 | 6.00 | 7.22 | 7.50 | 7.21 | 5.96 | 9.25 | 7.75 | 6.22 | 4.06 | 79.47 |
| Pumps & Aux. | 7.90 | 7.60 | 7.59 | 7.47 | 7.21 | 7.60 | 8.00 | 7.50 | 7.67 | 7.69 | 7.50 | 8.36 | 92.09 |
| Ext. Usage | 0.66 | 0.51 | 0.56 | 0.54 | 0.39 | 0.38 | 0.39 | 0.63 | 0.61 | 0.63 | 0.64 | 0.66 | 6.60 |
| Misc. Equip. | 16.76 | 17.46 | 14.78 | 15.98 | 19.43 | 13.57 | 8.82 | 8.63 | 16.59 | 19.96 | 17.08 | 10.66 | 179.72 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 17.65 | 18.26 | 16.21 | 17.09 | 20.41 | 14.38 | 9.66 | 9.32 | 17.40 | 20.72 | 18.13 | 12.27 | 191.51 |
| **Total** | 53.46 | 54.06 | 48.22 | 50.90 | 62.42 | 57.70 | 52.71 | 48.34 | 67.68 | 61.82 | 53.23 | 40.39 | 650.93 |

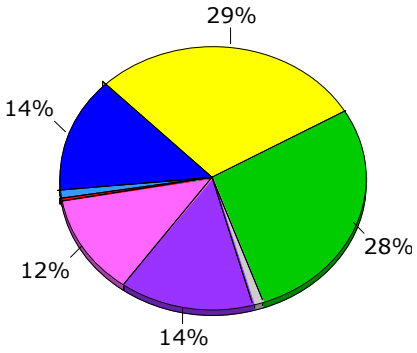
**Gas Consumption (Btu x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 368.9 | 291.7 | 205.3 | 128.6 | 34.5 | 11.7 | 10.1 | 10.2 | 16.1 | 70.6 | 151.8 | 319.3 | 1,618.7 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 114.4 | 120.9 | 101.7 | 109.1 | 120.2 | 81.6 | 53.1 | 49.3 | 87.2 | 108.7 | 98.7 | 70.2 | 1,115.0 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 23.4 | 24.7 | 19.5 | 22.1 | 27.3 | 13.0 | 0.1 | 0.1 | 20.8 | 28.5 | 23.4 | 13.1 | 216.0 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 506.7 | 437.3 | 326.5 | 259.8 | 182.0 | 106.3 | 63.2 | 59.6 | 124.1 | 207.8 | 273.9 | 402.6 | 2,949.7 |

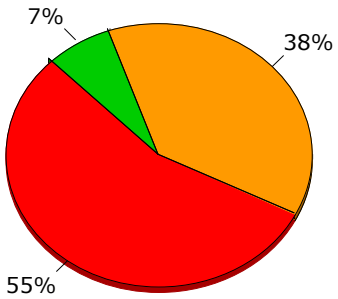
**Annual Energy Consumption by Enduse**

| | Electricity kWh (x000) | Natural Gas MBtu | Steam Btu | Chilled Water Btu |
|---|---|---|---|---|
| Space Cool | 91.97 | - | - | - |
| Heat Reject. | 6.65 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 2.92 | 1,618.7 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 1,115.0 | - | - |
| Vent. Fans | 79.47 | - | - | - |
| Pumps & Aux. | 92.09 | - | - | - |
| Ext. Usage | 6.60 | - | - | - |
| Misc. Equip. | 179.72 | 216.0 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 191.51 | - | - | - |
| **Total** | 650.93 | 2,949.7 | - | - |



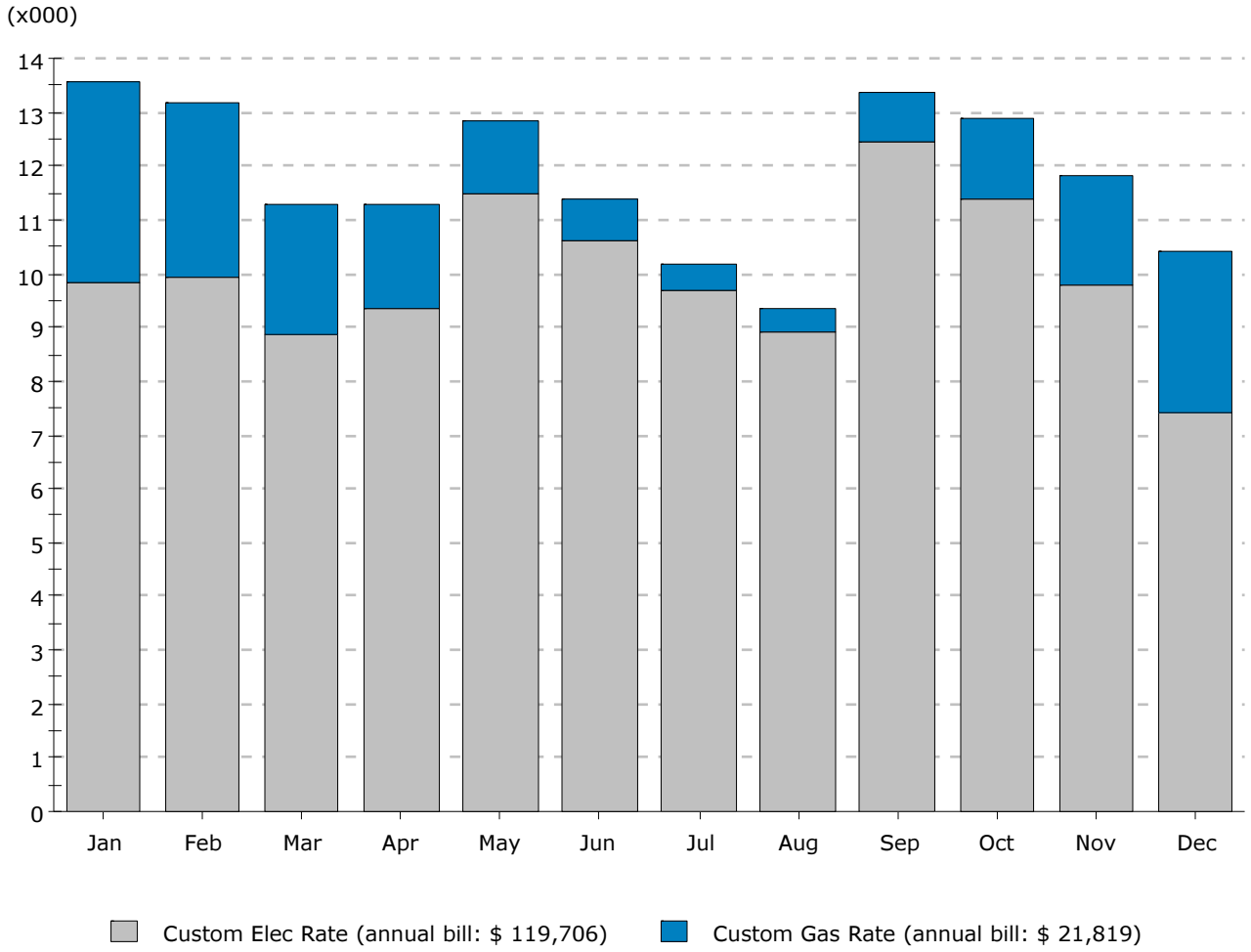




**Electricity**

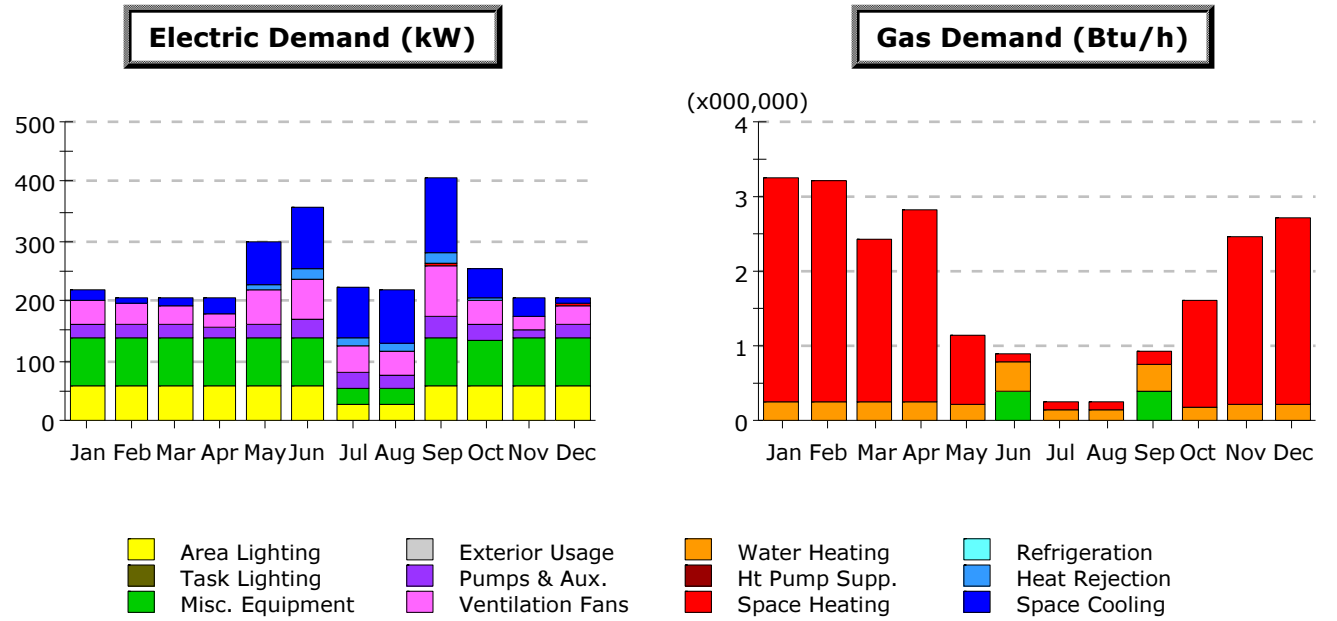



**Natural Gas**

## Monthly Utility Bills ($)




**Total Annual Bill Across All Rates: $ 141,525**




**Electric Demand (kW)**

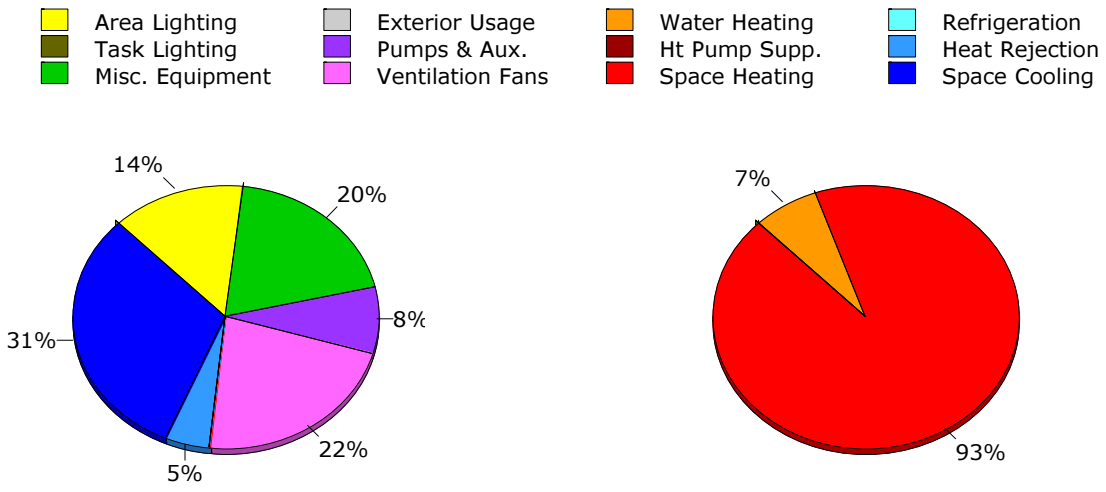
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 17.9 | 10.3 | 10.6 | 29.5 | 73.0 | 106.8 | 82.3 | 87.0 | 128.1 | 48.4 | 31.7 | 9.7 | 635.5 |
| Heat Reject. | - | - | - | - | 7.5 | 14.6 | 16.0 | 15.0 | 18.9 | 4.6 | 0.4 | - | 77.0 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 1.0 | 1.1 | 0.8 | 0.6 | 0.2 | 0.3 | 0.1 | 0.2 | 0.3 | 0.4 | 0.4 | 0.9 | 6.3 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 36.7 | 34.5 | 31.7 | 21.8 | 56.5 | 68.9 | 44.8 | 37.3 | 89.1 | 41.9 | 20.5 | 32.4 | 515.8 |
| Pumps & Aux. | 22.1 | 22.3 | 21.4 | 16.2 | 25.1 | 31.5 | 26.3 | 26.3 | 33.1 | 23.6 | 16.4 | 21.8 | 286.0 |
| Ext. Usage | - | - | - | - | - | - | - | 0.3 | - | - | - | - | 0.3 |
| Misc. Equip. | 80.8 | 79.7 | 80.8 | 79.7 | 77.8 | 77.8 | 24.0 | 24.3 | 79.7 | 76.8 | 77.8 | 80.8 | 840.1 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 28.1 | 27.1 | 59.2 | 59.2 | 59.2 | 59.2 | 647.2 |
| **Total** | 217.6 | 207.2 | 204.6 | 206.9 | 299.3 | 359.1 | 221.7 | 217.5 | 408.3 | 254.8 | 206.4 | 204.7 | 3,008.2 |

**Gas Demand (Btu/h x000,000)**

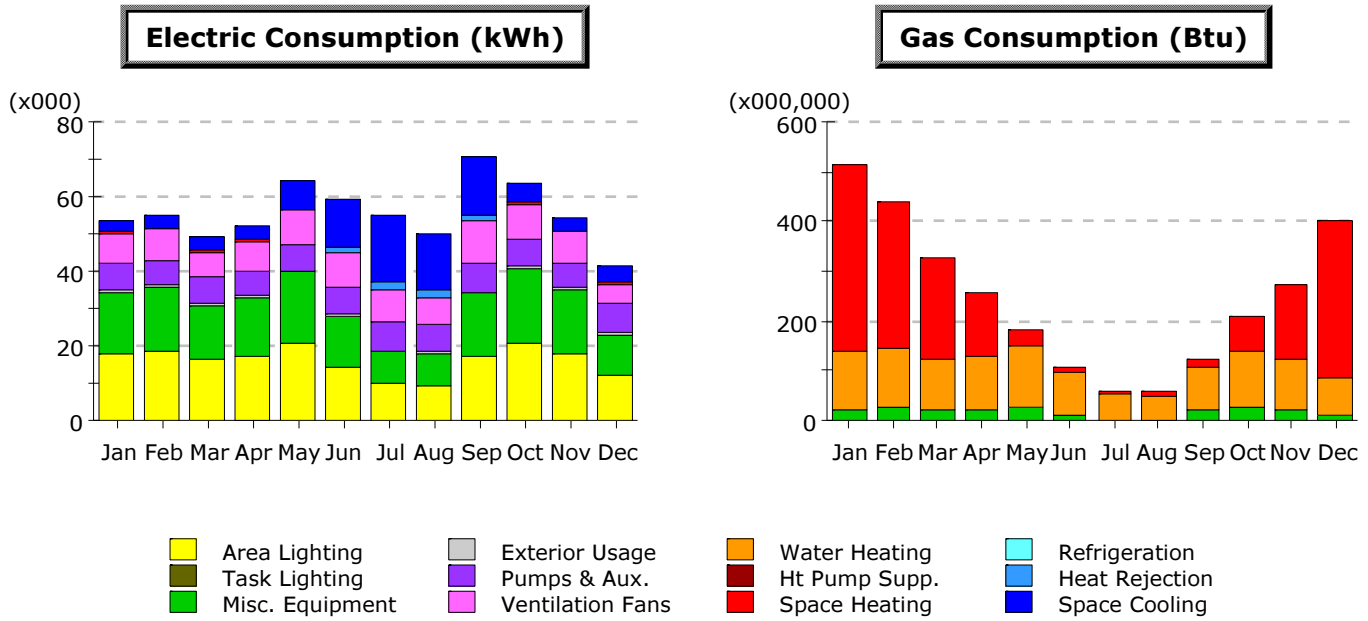
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 3.02 | 2.98 | 2.18 | 2.57 | 0.92 | 0.11 | 0.10 | 0.10 | 0.19 | 1.42 | 2.27 | 2.48 | 18.33 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 0.23 | 0.24 | 0.24 | 0.23 | 0.22 | 0.40 | 0.15 | 0.15 | 0.36 | 0.19 | 0.20 | 0.22 | 2.83 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | - | - | 0.38 | 0.00 | 0.00 | 0.00 | 0.79 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 3.25 | 3.22 | 2.43 | 2.80 | 1.14 | 0.89 | 0.25 | 0.24 | 0.93 | 1.61 | 2.47 | 2.70 | 21.95 |

**Annual Peak Demand by Enduse**

| | Electricity kW | Natural Gas Btu/h (x000) | Steam Btu/h | Chilled Water Btu/h |
|---|---|---|---|---|
| Space Cool | 128.14 | - | - | - |
| Heat Reject. | 18.86 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 0.25 | 3,016.1 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 232.0 | - | - |
| Vent. Fans | 89.11 | - | - | - |
| Pumps & Aux. | 33.05 | - | - | - |
| Ext. Usage | - | - | - | - |
| Misc. Equip. | 79.71 | 3.8 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 59.19 | - | - | - |
| **Total** | 408.31 | 3,251.9 | - | - |




**Electricity** **Natural Gas**




**Electric Consumption (kWh x000)**

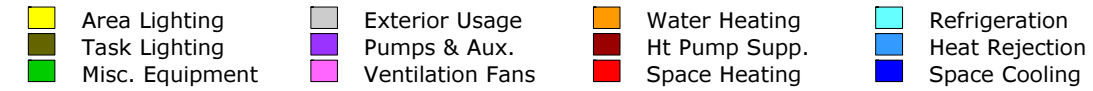
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 3.38 | 3.11 | 3.35 | 3.57 | 7.64 | 13.50 | 17.29 | 15.19 | 15.34 | 5.01 | 3.46 | 3.99 | 94.84 |
| Heat Reject. | 0.00 | 0.00 | - | 0.01 | 0.30 | 1.16 | 2.10 | 1.67 | 1.55 | 0.11 | 0.01 | 0.00 | 6.90 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 0.57 | 0.46 | 0.40 | 0.29 | 0.10 | 0.04 | 0.03 | 0.03 | 0.05 | 0.17 | 0.28 | 0.51 | 2.92 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 7.81 | 8.39 | 6.93 | 7.71 | 8.95 | 9.33 | 9.14 | 7.47 | 11.65 | 9.83 | 8.05 | 5.16 | 100.41 |
| Pumps & Aux. | 6.93 | 6.50 | 6.72 | 6.63 | 6.97 | 7.23 | 7.23 | 6.96 | 7.35 | 6.93 | 6.56 | 7.96 | 83.97 |
| Ext. Usage | 0.66 | 0.51 | 0.56 | 0.54 | 0.39 | 0.38 | 0.39 | 0.63 | 0.61 | 0.63 | 0.64 | 0.66 | 6.60 |
| Misc. Equip. | 16.76 | 17.46 | 14.78 | 15.98 | 19.43 | 13.57 | 8.82 | 8.63 | 16.59 | 19.96 | 17.08 | 10.66 | 179.72 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 17.65 | 18.26 | 16.21 | 17.09 | 20.41 | 14.38 | 9.66 | 9.32 | 17.40 | 20.72 | 18.13 | 12.27 | 191.51 |
| **Total** | 53.77 | 54.68 | 48.95 | 51.82 | 64.18 | 59.59 | 54.66 | 49.90 | 70.54 | 63.36 | 54.20 | 41.21 | 666.87 |

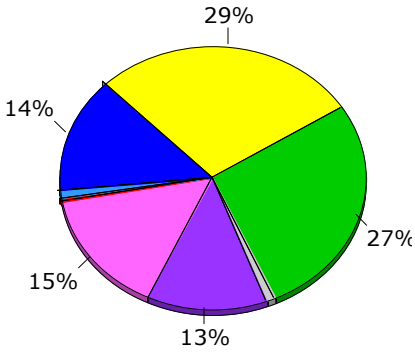
**Gas Consumption (Btu x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 377.9 | 295.6 | 206.3 | 128.5 | 34.3 | 11.1 | 8.4 | 9.6 | 15.9 | 70.2 | 152.1 | 320.1 | 1,630.1 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 114.4 | 120.9 | 101.7 | 109.1 | 120.2 | 81.6 | 53.1 | 49.3 | 87.2 | 108.7 | 98.7 | 70.2 | 1,115.0 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 23.4 | 24.7 | 19.5 | 22.1 | 27.3 | 13.0 | 0.1 | 0.1 | 20.8 | 28.5 | 23.4 | 13.1 | 216.0 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 515.6 | 441.2 | 327.5 | 259.7 | 181.8 | 105.7 | 61.6 | 59.0 | 123.8 | 207.5 | 274.1 | 403.5 | 2,961.0 |

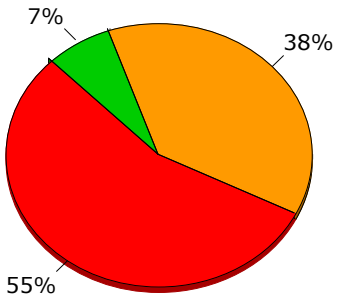
**Annual Energy Consumption by Enduse**

| | Electricity kWh (x000) | Natural Gas MBtu | Steam Btu | Chilled Water Btu |
|---|---|---|---|---|
| Space Cool | 94.84 | - | - | - |
| Heat Reject. | 6.90 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 2.92 | 1,630.1 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 1,115.0 | - | - |
| Vent. Fans | 100.41 | - | - | - |
| Pumps & Aux. | 83.97 | - | - | - |
| Ext. Usage | 6.60 | - | - | - |
| Misc. Equip. | 179.72 | 216.0 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 191.51 | - | - | - |
| **Total** | 666.87 | 2,961.0 | - | - |



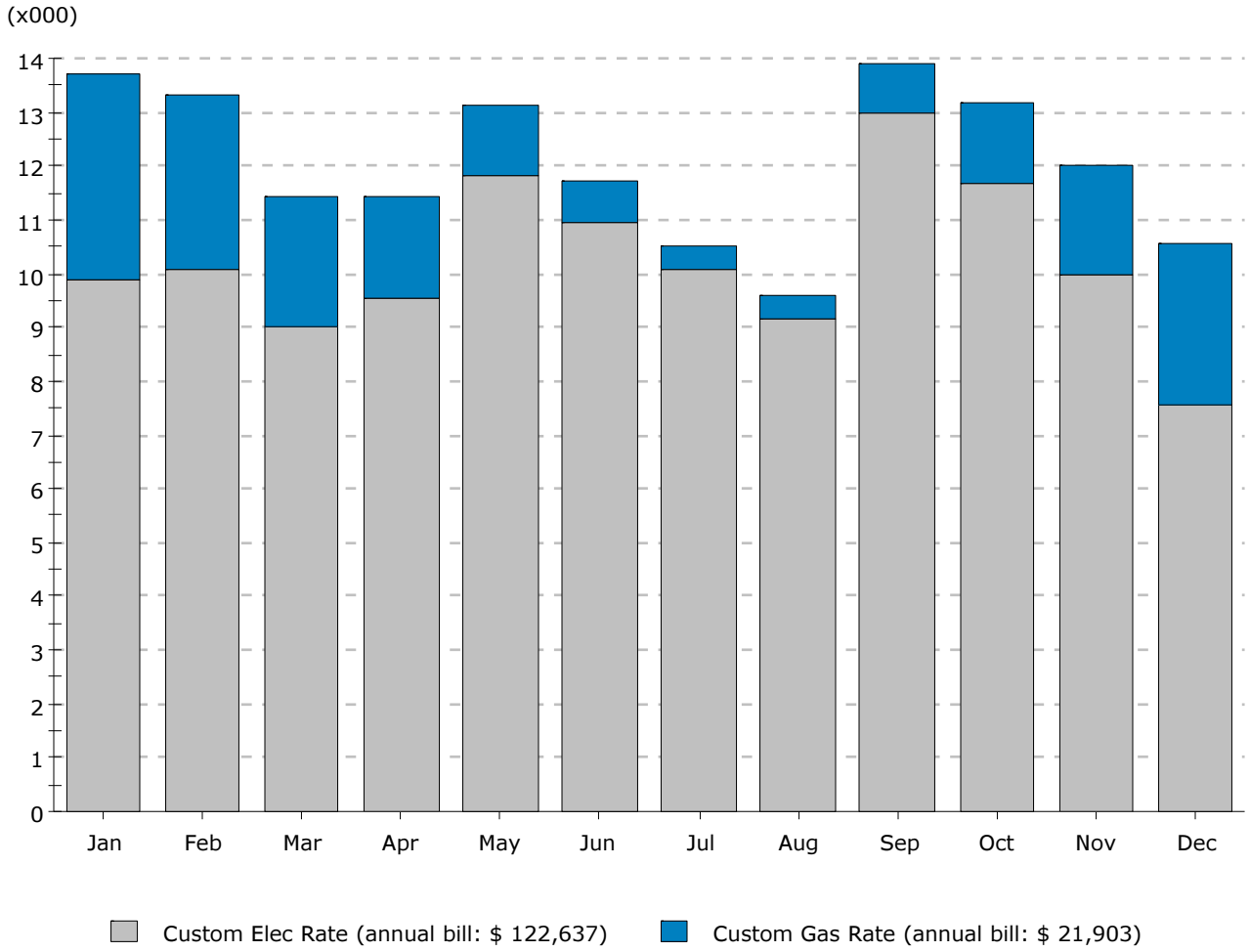




**Electricity**

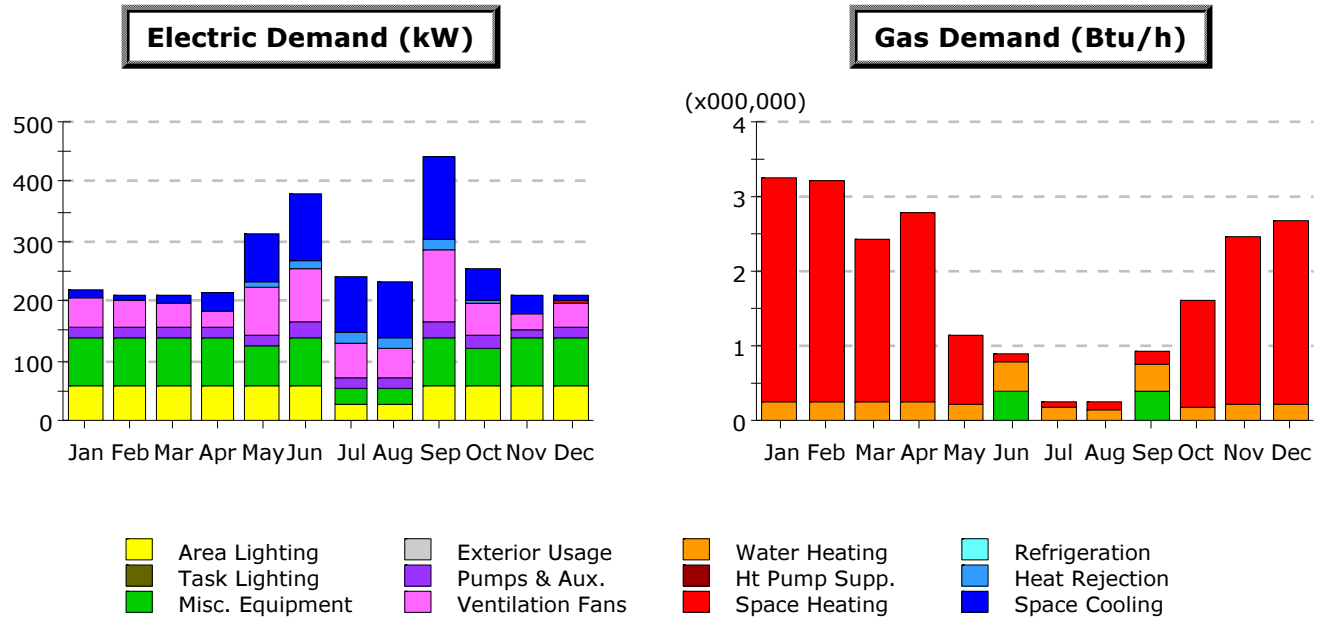



**Natural Gas**

## Monthly Utility Bills ($)




**Total Annual Bill Across All Rates: $ 144,540**




**Electric Demand (kW)**

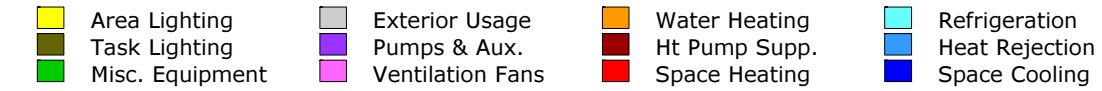
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 15.0 | 6.5 | 10.9 | 31.0 | 81.9 | 112.5 | 92.3 | 93.7 | 138.9 | 50.9 | 32.6 | 9.3 | 675.5 |
| Heat Reject. | - | - | - | - | 8.4 | 15.4 | 17.2 | 15.7 | 19.9 | 5.3 | 0.4 | - | 82.2 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 1.0 | 1.0 | 0.8 | 0.6 | 0.2 | 0.3 | - | 0.2 | 0.2 | 0.3 | 0.4 | 0.9 | 5.8 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 46.6 | 44.2 | 40.6 | 25.8 | 77.1 | 89.0 | 58.1 | 47.8 | 116.4 | 55.2 | 24.3 | 41.6 | 666.7 |
| Pumps & Aux. | 16.8 | 16.8 | 16.6 | 16.7 | 20.9 | 26.9 | 21.3 | 21.9 | 28.3 | 19.5 | 16.9 | 16.6 | 239.1 |
| Ext. Usage | - | - | - | - | - | - | - | 0.3 | - | - | - | - | 0.3 |
| Misc. Equip. | 80.8 | 80.8 | 80.8 | 79.7 | 64.4 | 77.8 | 24.0 | 24.3 | 79.7 | 63.3 | 77.8 | 80.8 | 814.3 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 28.1 | 27.1 | 59.2 | 59.2 | 59.2 | 59.2 | 647.3 |
| **Total** | 219.3 | 208.5 | 209.0 | 212.8 | 312.0 | 381.1 | 241.0 | 231.0 | 442.6 | 253.8 | 211.7 | 208.4 | 3,131.1 |

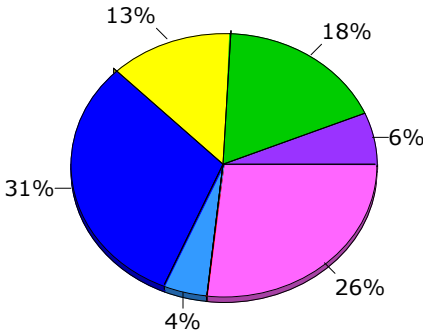
**Gas Demand (Btu/h x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 3.00 | 2.96 | 2.18 | 2.54 | 0.92 | 0.11 | 0.09 | 0.10 | 0.18 | 1.41 | 2.26 | 2.47 | 18.20 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 0.23 | 0.24 | 0.24 | 0.23 | 0.22 | 0.40 | 0.18 | 0.14 | 0.36 | 0.19 | 0.20 | 0.22 | 2.85 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | - | - | 0.38 | 0.00 | 0.00 | 0.00 | 0.79 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 3.23 | 3.20 | 2.42 | 2.78 | 1.14 | 0.89 | 0.26 | 0.25 | 0.92 | 1.60 | 2.47 | 2.69 | 21.84 |

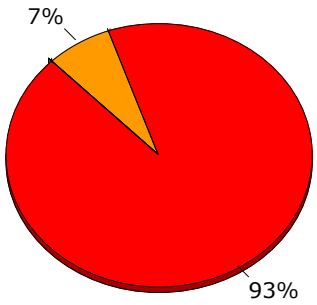
**Annual Peak Demand by Enduse**

| | Electricity kW | Natural Gas Btu/h (x000) | Steam Btu/h | Chilled Water Btu/h |
|---|---|---|---|---|
| Space Cool | 138.91 | - | - | - |
| Heat Reject. | 19.90 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 0.25 | 2,997.8 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 232.0 | - | - |
| Vent. Fans | 116.40 | - | - | - |
| Pumps & Aux. | 28.27 | - | - | - |
| Ext. Usage | - | - | - | - |
| Misc. Equip. | 79.71 | 3.8 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 59.19 | - | - | - |
| **Total** | 442.62 | 3,233.6 | - | - |

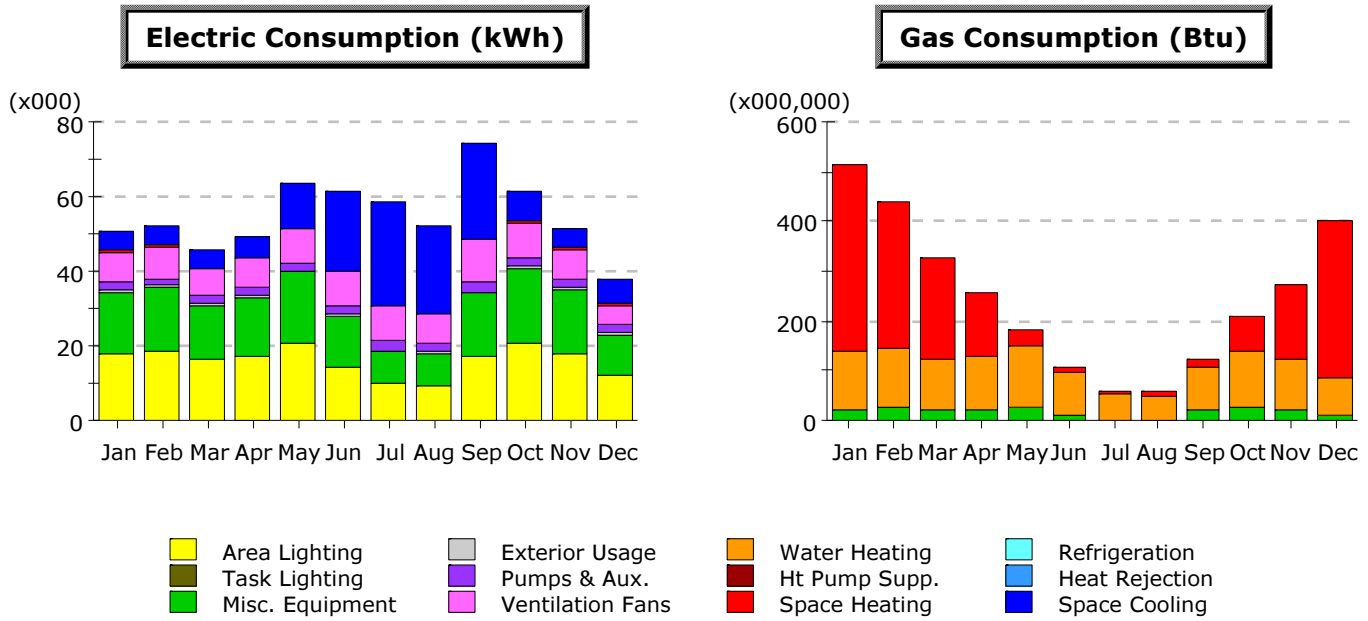



**Electricity**




**Natural Gas**




**Electric Consumption (kWh x000)**

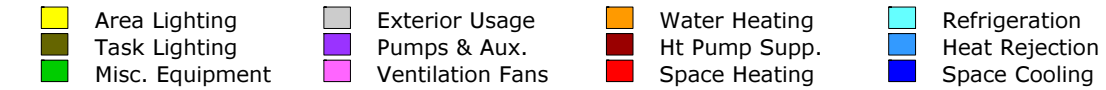
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 5.31 | 4.86 | 5.22 | 5.53 | 12.09 | 21.52 | 27.80 | 23.66 | 25.33 | 7.89 | 5.40 | 6.23 | 150.83 |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 0.57 | 0.46 | 0.40 | 0.29 | 0.10 | 0.04 | 0.03 | 0.03 | 0.05 | 0.17 | 0.28 | 0.51 | 2.92 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 7.81 | 8.39 | 6.93 | 7.71 | 8.95 | 9.33 | 9.14 | 7.47 | 11.65 | 9.83 | 8.05 | 5.16 | 100.41 |
| Pumps & Aux. | 2.07 | 1.89 | 1.97 | 1.92 | 2.05 | 2.27 | 2.49 | 2.35 | 2.46 | 2.01 | 1.92 | 2.17 | 25.57 |
| Ext. Usage | 0.66 | 0.51 | 0.56 | 0.54 | 0.39 | 0.38 | 0.39 | 0.63 | 0.61 | 0.63 | 0.64 | 0.66 | 6.60 |
| Misc. Equip. | 16.76 | 17.46 | 14.78 | 15.98 | 19.43 | 13.57 | 8.82 | 8.63 | 16.59 | 19.96 | 17.08 | 10.66 | 179.72 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 17.65 | 18.26 | 16.21 | 17.09 | 20.41 | 14.38 | 9.66 | 9.32 | 17.40 | 20.72 | 18.13 | 12.27 | 191.51 |
| **Total** | 50.84 | 51.83 | 46.06 | 49.06 | 63.41 | 61.48 | 58.33 | 52.09 | 74.09 | 61.21 | 51.49 | 37.66 | 657.56 |

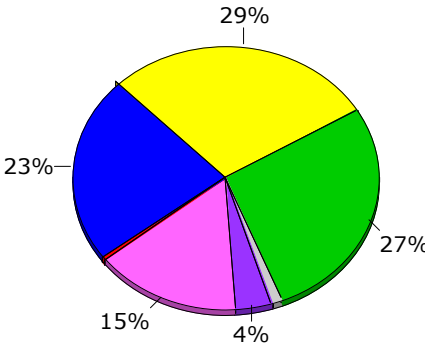
**Gas Consumption (Btu x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 377.9 | 295.6 | 206.3 | 128.5 | 34.3 | 11.1 | 8.4 | 9.6 | 15.9 | 70.2 | 152.1 | 320.1 | 1,630.1 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 114.4 | 120.9 | 101.7 | 109.1 | 120.2 | 81.6 | 53.1 | 49.3 | 87.2 | 108.7 | 98.7 | 70.2 | 1,115.0 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 23.4 | 24.7 | 19.5 | 22.1 | 27.3 | 13.0 | 0.1 | 0.1 | 20.8 | 28.5 | 23.4 | 13.1 | 216.0 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 515.6 | 441.2 | 327.5 | 259.7 | 181.8 | 105.7 | 61.6 | 59.0 | 123.8 | 207.5 | 274.1 | 403.5 | 2,961.0 |

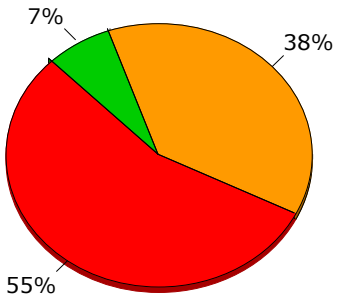
**Annual Energy Consumption by Enduse**

| | Electricity kWh (x000) | Natural Gas MBtu | Steam Btu | Chilled Water Btu |
|---|---|---|---|---|
| Space Cool | 150.83 | - | - | - |
| Heat Reject. | - | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 2.92 | 1,630.1 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 1,115.0 | - | - |
| Vent. Fans | 100.41 | - | - | - |
| Pumps & Aux. | 25.57 | - | - | - |
| Ext. Usage | 6.60 | - | - | - |
| Misc. Equip. | 179.72 | 216.0 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 191.51 | - | - | - |
| **Total** | 657.56 | 2,961.0 | - | - |



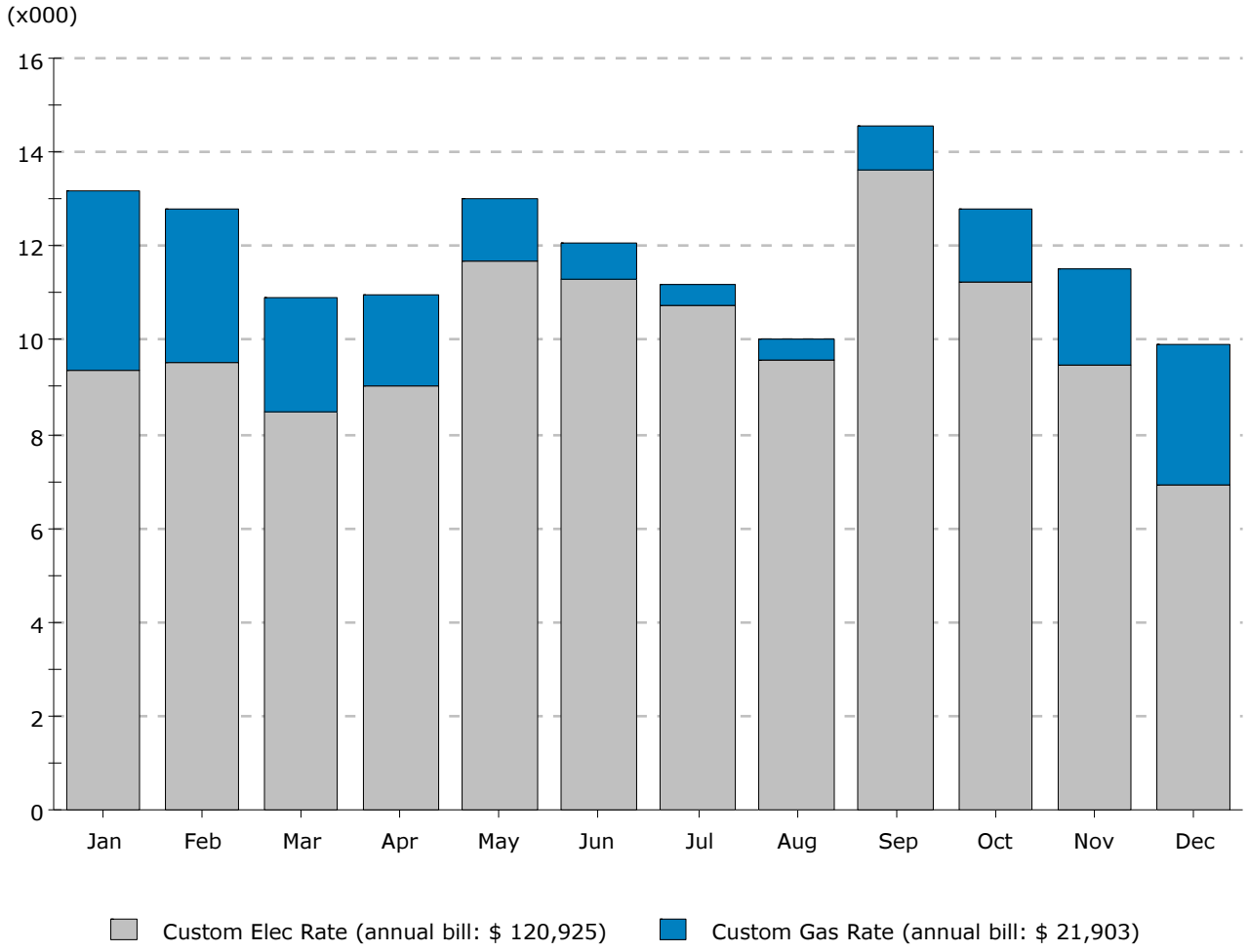




**Electricity**

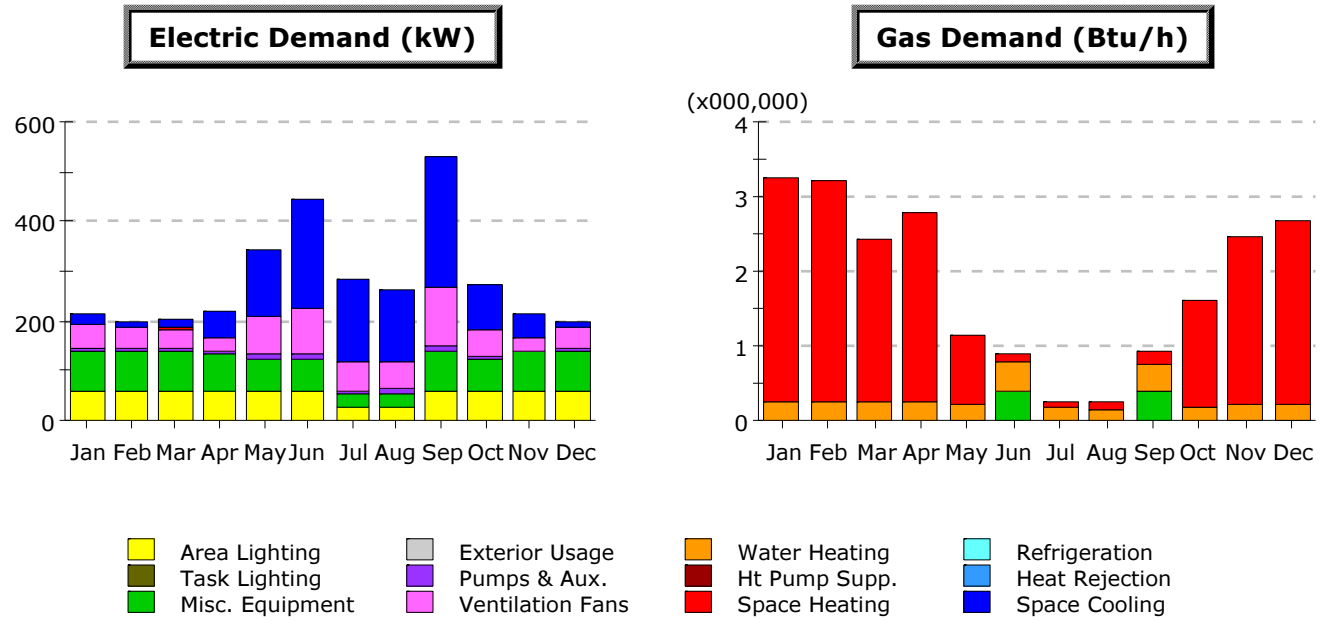



**Natural Gas**

## Monthly Utility Bills ($)




**Total Annual Bill Across All Rates: $ 142,828**




**Electric Demand (kW)**

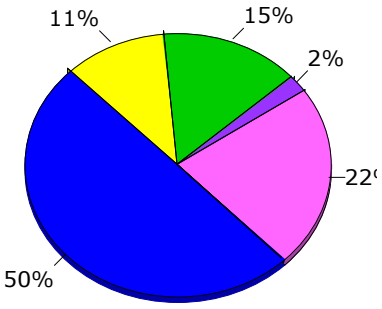
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 23.8 | 9.8 | 17.0 | 50.9 | 135.9 | 219.0 | 165.4 | 145.2 | 263.2 | 88.5 | 50.2 | 14.3 | 1,183.2 |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 1.0 | 1.0 | 0.8 | 0.4 | 0.2 | 0.2 | - | - | 0.2 | 0.3 | 0.4 | 0.9 | 5.5 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 46.6 | 44.2 | 40.6 | 26.0 | 77.1 | 93.1 | 58.1 | 55.2 | 116.4 | 55.2 | 24.3 | 41.6 | 678.3 |
| Pumps & Aux. | 4.0 | 4.0 | 3.8 | 4.1 | 8.1 | 10.3 | 8.5 | 8.5 | 10.9 | 6.7 | 4.1 | 3.8 | 76.7 |
| Ext. Usage | - | - | - | - | - | - | - | 0.3 | - | - | - | - | 0.3 |
| Misc. Equip. | 80.8 | 80.8 | 80.8 | 76.8 | 64.4 | 64.4 | 24.0 | 24.3 | 79.7 | 63.3 | 77.8 | 80.8 | 797.9 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 28.1 | 29.1 | 59.2 | 59.2 | 59.2 | 59.2 | 649.3 |
| **Total** | 215.3 | 199.0 | 202.2 | 217.3 | 344.8 | 446.2 | 284.1 | 262.7 | 529.7 | 273.2 | 216.1 | 200.6 | 3,391.2 |

**Gas Demand (Btu/h x000,000)**

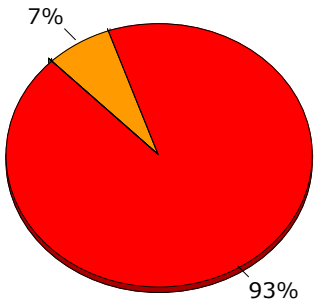
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 3.00 | 2.96 | 2.18 | 2.54 | 0.92 | 0.11 | 0.09 | 0.10 | 0.18 | 1.41 | 2.26 | 2.47 | 18.20 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 0.23 | 0.24 | 0.24 | 0.23 | 0.22 | 0.40 | 0.18 | 0.14 | 0.36 | 0.19 | 0.20 | 0.22 | 2.85 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | - | - | 0.38 | 0.00 | 0.00 | 0.00 | 0.79 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 3.23 | 3.20 | 2.42 | 2.78 | 1.14 | 0.89 | 0.26 | 0.25 | 0.92 | 1.60 | 2.47 | 2.69 | 21.84 |

**Annual Peak Demand by Enduse**

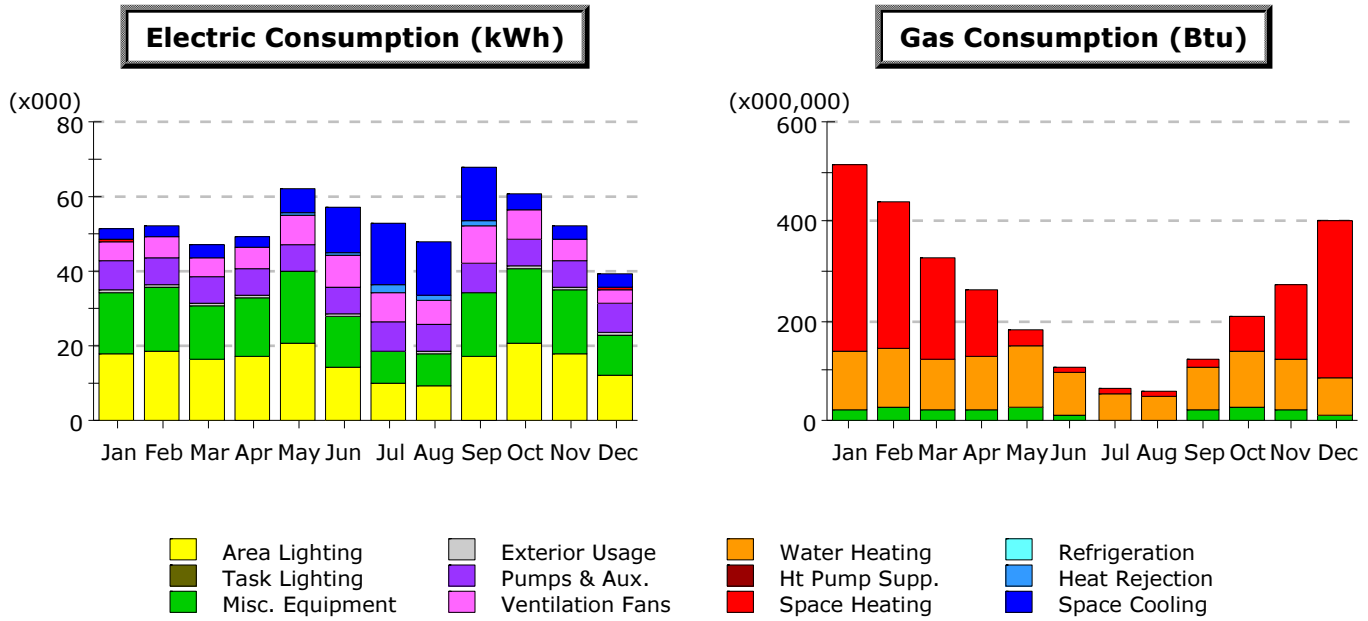
| | Electricity kW | Natural Gas Btu/h (x000) | Steam Btu/h | Chilled Water Btu/h |
|---|---|---|---|---|
| Space Cool | 263.24 | - | - | - |
| Heat Reject. | - | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 0.25 | 2,997.8 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 232.0 | - | - |
| Vent. Fans | 116.40 | - | - | - |
| Pumps & Aux. | 10.90 | - | - | - |
| Ext. Usage | - | - | - | - |
| Misc. Equip. | 79.71 | 3.8 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 59.19 | - | - | - |
| **Total** | 529.69 | 3,233.6 | - | - |


**Electricity**




**Natural Gas**




**Electric Consumption (kWh x000)**

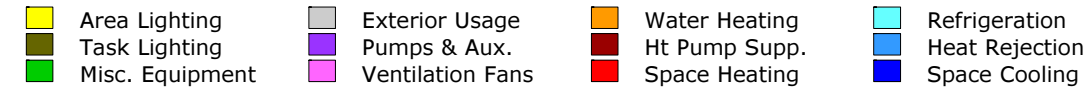
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 3.03 | 2.82 | 2.96 | 3.12 | 6.89 | 12.30 | 16.06 | 13.97 | 14.10 | 4.43 | 3.07 | 3.45 | 86.21 |
| Heat Reject. | 0.00 | - | 0.00 | 0.01 | 0.30 | 1.09 | 1.92 | 1.55 | 1.45 | 0.11 | 0.01 | 0.00 | 6.44 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 0.61 | 0.49 | 0.43 | 0.31 | 0.10 | 0.04 | 0.03 | 0.03 | 0.05 | 0.18 | 0.30 | 0.56 | 3.13 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 5.25 | 5.58 | 4.72 | 5.44 | 7.80 | 8.43 | 8.01 | 6.46 | 10.06 | 7.67 | 5.54 | 3.73 | 78.70 |
| Pumps & Aux. | 7.52 | 7.19 | 7.16 | 7.03 | 6.95 | 7.21 | 7.71 | 7.17 | 7.33 | 7.36 | 7.09 | 7.69 | 87.40 |
| Ext. Usage | 0.66 | 0.51 | 0.56 | 0.54 | 0.39 | 0.38 | 0.39 | 0.63 | 0.61 | 0.63 | 0.64 | 0.66 | 6.60 |
| Misc. Equip. | 16.76 | 17.46 | 14.78 | 15.98 | 19.43 | 13.57 | 8.82 | 8.63 | 16.59 | 19.96 | 17.08 | 10.66 | 179.72 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 17.65 | 18.26 | 16.21 | 17.09 | 20.41 | 14.38 | 9.66 | 9.32 | 17.40 | 20.72 | 18.13 | 12.27 | 191.51 |
| **Total** | 51.50 | 52.32 | 46.81 | 49.52 | 62.26 | 57.41 | 52.60 | 47.77 | 67.60 | 61.06 | 51.85 | 39.02 | 639.71 |

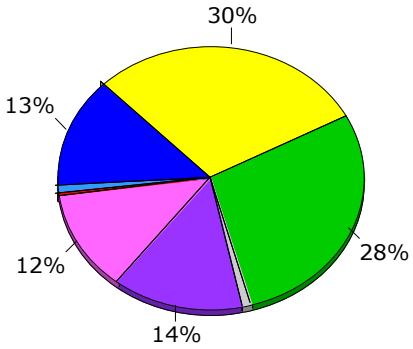
**Gas Consumption (Btu x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 377.5 | 294.9 | 205.8 | 129.7 | 33.8 | 11.6 | 9.6 | 10.0 | 16.0 | 69.8 | 150.3 | 318.6 | 1,627.6 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 114.4 | 120.9 | 101.7 | 109.1 | 120.2 | 81.6 | 53.0 | 49.3 | 87.2 | 108.7 | 98.7 | 70.2 | 1,114.9 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 23.4 | 24.7 | 19.5 | 22.1 | 27.3 | 13.0 | 0.1 | 0.1 | 20.8 | 28.5 | 23.4 | 13.1 | 216.0 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 515.3 | 440.4 | 327.0 | 260.9 | 181.2 | 106.2 | 62.8 | 59.5 | 123.9 | 207.0 | 272.4 | 401.9 | 2,958.5 |

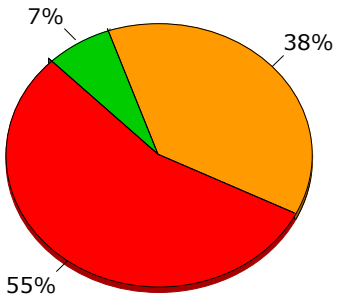
**Annual Energy Consumption by Enduse**

| | Electricity kWh (x000) | Natural Gas MBtu | Steam Btu | Chilled Water Btu |
|---|---|---|---|---|
| Space Cool | 86.21 | - | - | - |
| Heat Reject. | 6.44 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 3.13 | 1,627.6 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 1,114.9 | - | - |
| Vent. Fans | 78.70 | - | - | - |
| Pumps & Aux. | 87.40 | - | - | - |
| Ext. Usage | 6.60 | - | - | - |
| Misc. Equip. | 179.72 | 216.0 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 191.51 | - | - | - |
| **Total** | 639.71 | 2,958.5 | - | - |



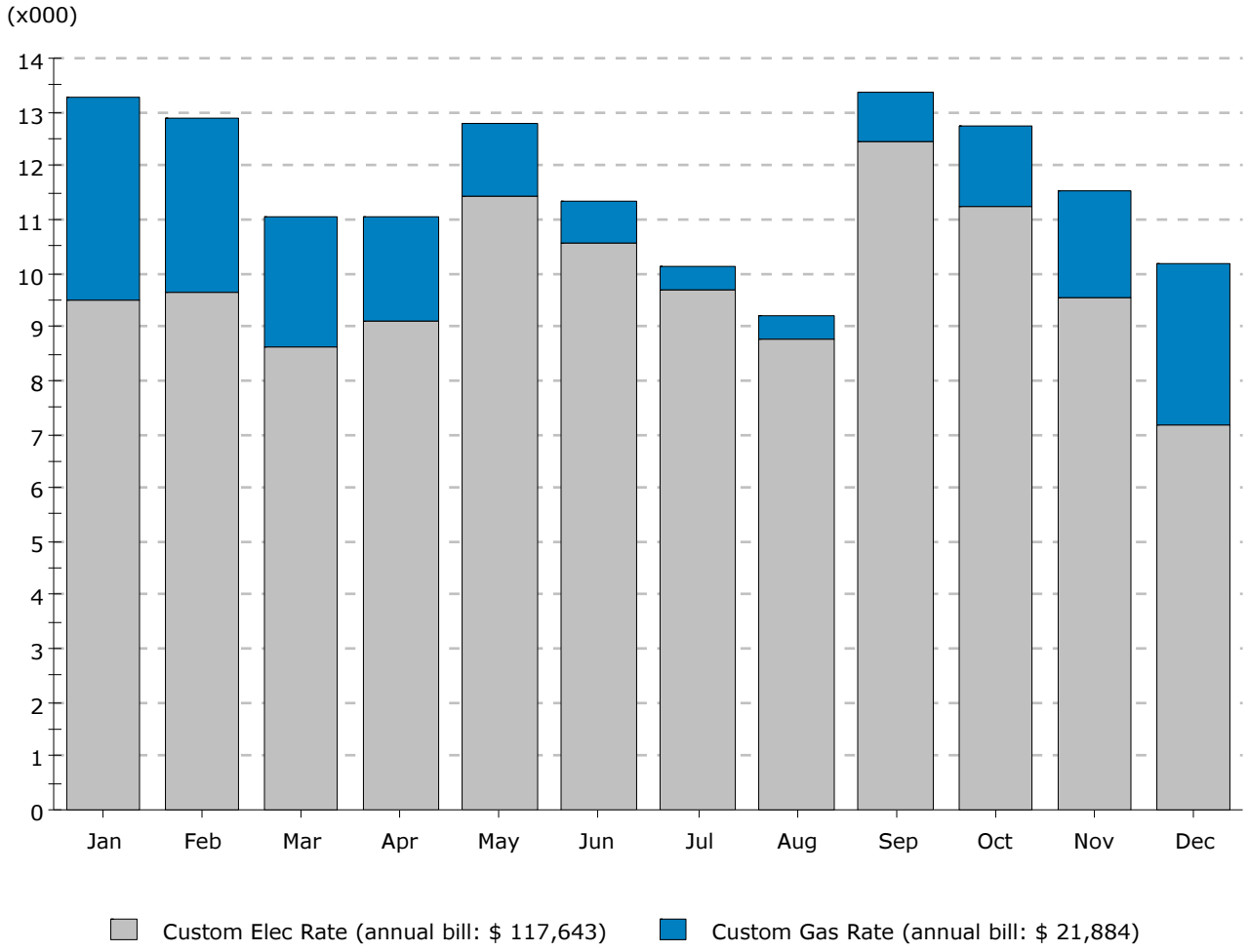




**Electricity**

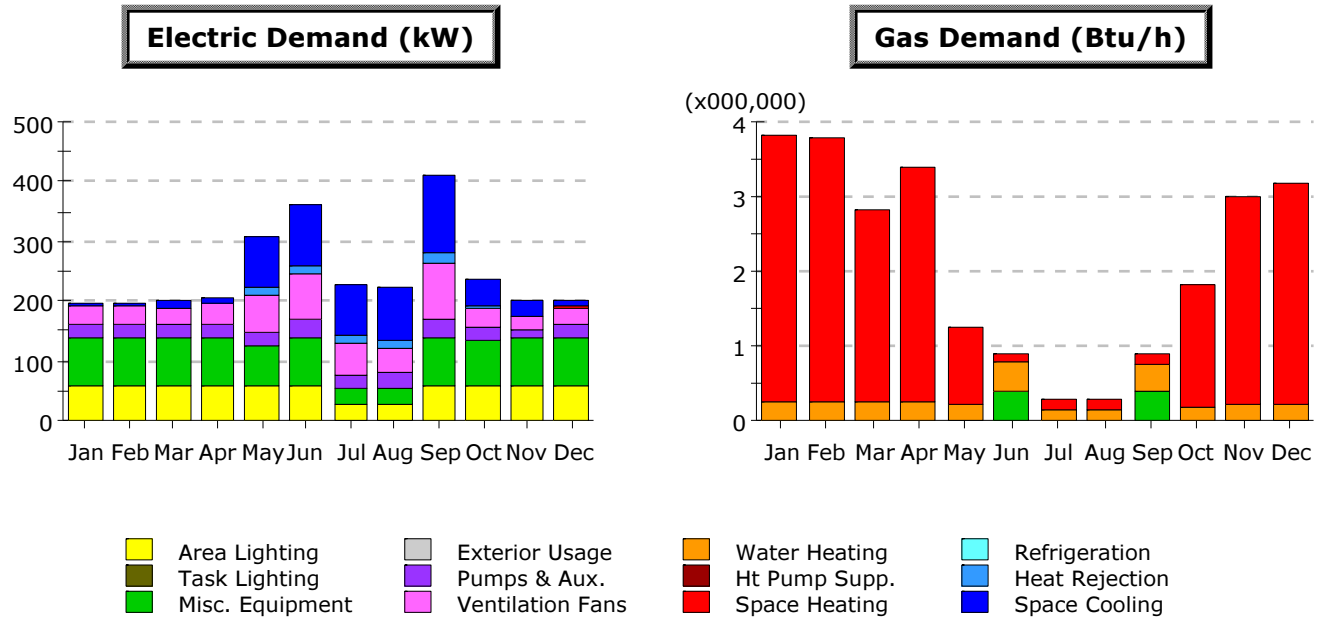



**Natural Gas**

## Monthly Utility Bills ($)




**Total Annual Bill Across All Rates: $ 139,527**




**Electric Demand (kW)**

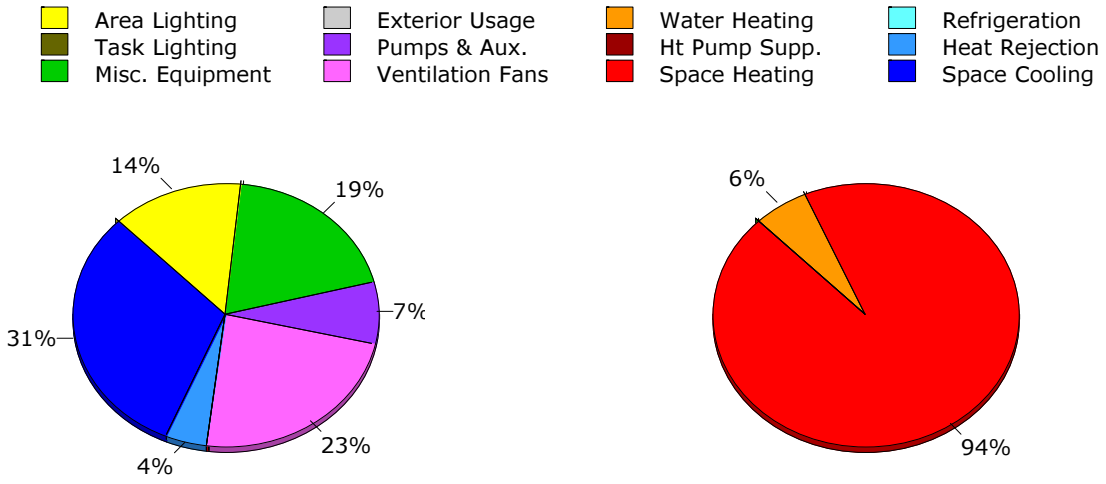
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 5.6 | 5.6 | 9.8 | 5.4 | 85.9 | 104.2 | 84.2 | 87.8 | 129.0 | 43.2 | 27.8 | 8.9 | 597.4 |
| Heat Reject. | - | - | - | - | 10.1 | 13.9 | 14.7 | 13.6 | 17.6 | 4.3 | 0.3 | - | 74.4 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 1.0 | 0.9 | 0.9 | 0.7 | 0.2 | 0.3 | - | 0.2 | 0.3 | 0.4 | 0.4 | 1.0 | 6.3 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 30.8 | 29.6 | 28.1 | 37.3 | 62.7 | 76.1 | 50.2 | 41.5 | 94.8 | 32.3 | 21.5 | 28.3 | 533.0 |
| Pumps & Aux. | 20.8 | 20.6 | 20.3 | 20.5 | 25.4 | 30.4 | 25.6 | 28.3 | 30.6 | 19.6 | 14.8 | 20.7 | 277.6 |
| Ext. Usage | - | - | - | - | - | - | - | 0.3 | - | - | - | - | 0.3 |
| Misc. Equip. | 80.8 | 80.8 | 80.8 | 80.8 | 64.4 | 77.8 | 24.0 | 24.3 | 79.7 | 76.8 | 77.8 | 80.8 | 828.7 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 27.9 | 27.1 | 59.2 | 59.2 | 59.2 | 59.2 | 647.1 |
| **Total** | 198.2 | 196.7 | 199.1 | 203.9 | 307.8 | 361.9 | 226.5 | 223.2 | 411.1 | 235.7 | 201.8 | 198.9 | 2,964.9 |

**Gas Demand (Btu/h x000,000)**

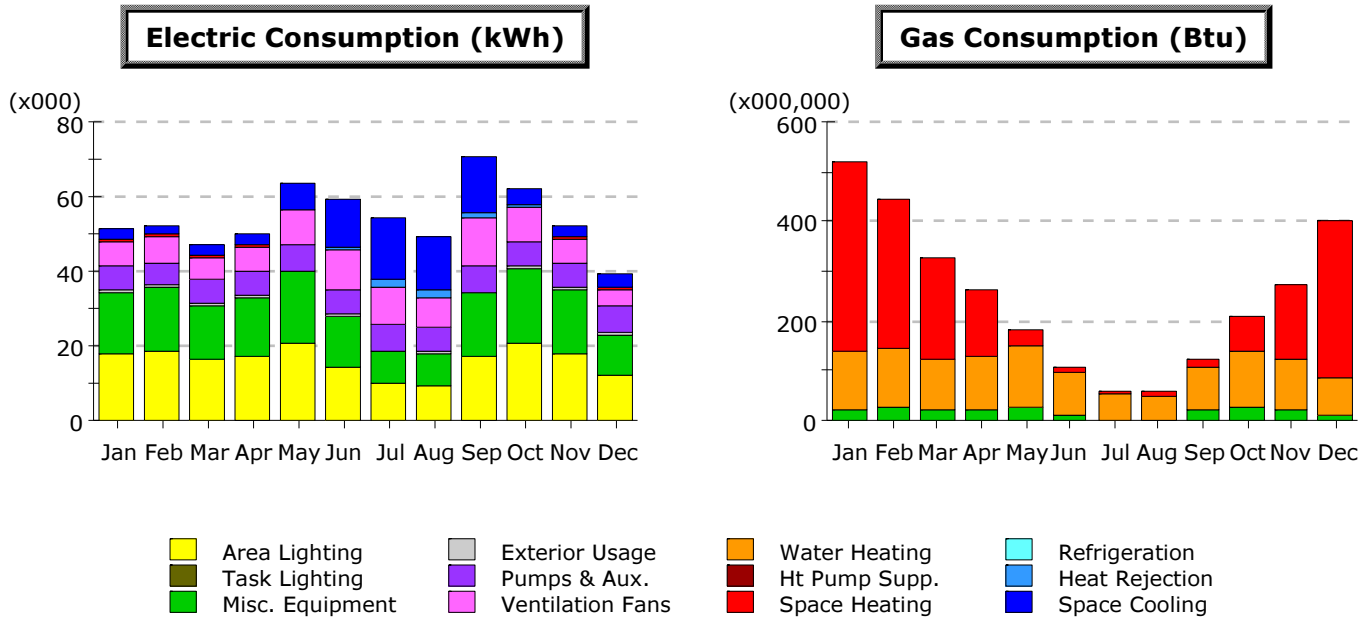
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 3.59 | 3.55 | 2.59 | 3.16 | 1.02 | 0.11 | 0.12 | 0.12 | 0.17 | 1.64 | 2.81 | 2.95 | 21.83 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 0.23 | 0.24 | 0.24 | 0.23 | 0.22 | 0.40 | 0.15 | 0.15 | 0.36 | 0.19 | 0.20 | 0.22 | 2.83 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | - | - | 0.38 | 0.00 | 0.00 | 0.00 | 0.79 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 3.82 | 3.80 | 2.84 | 3.40 | 1.24 | 0.89 | 0.27 | 0.27 | 0.91 | 1.83 | 3.02 | 3.17 | 25.45 |

**Annual Peak Demand by Enduse**

| | Electricity kW | Natural Gas Btu/h (x000) | Steam Btu/h | Chilled Water Btu/h |
|---|---|---|---|---|
| Space Cool | 128.98 | - | - | - |
| Heat Reject. | 17.57 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 0.27 | 3,588.2 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 232.0 | - | - |
| Vent. Fans | 94.81 | - | - | - |
| Pumps & Aux. | 30.60 | - | - | - |
| Ext. Usage | - | - | - | - |
| Misc. Equip. | 79.71 | 3.8 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 59.19 | - | - | - |
| **Total** | 411.13 | 3,824.0 | - | - |




**Electricity** **Natural Gas**




**Electric Consumption (kWh x000)**

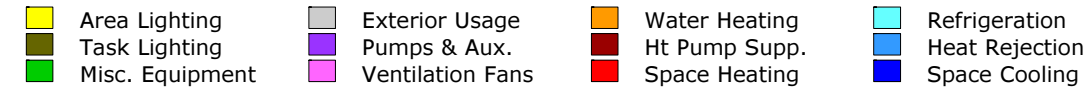
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 2.99 | 2.76 | 2.97 | 3.16 | 7.04 | 12.67 | 16.78 | 14.51 | 14.87 | 4.58 | 3.14 | 3.53 | 89.00 |
| Heat Reject. | 0.00 | - | 0.00 | 0.01 | 0.30 | 1.12 | 2.03 | 1.62 | 1.51 | 0.11 | 0.01 | 0.00 | 6.71 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 0.61 | 0.49 | 0.43 | 0.31 | 0.10 | 0.04 | 0.03 | 0.03 | 0.05 | 0.18 | 0.30 | 0.56 | 3.13 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 6.46 | 6.98 | 5.95 | 6.81 | 9.47 | 10.34 | 10.00 | 7.98 | 12.46 | 9.55 | 6.98 | 4.60 | 97.59 |
| Pumps & Aux. | 6.34 | 5.94 | 6.17 | 6.07 | 6.59 | 6.78 | 6.87 | 6.56 | 6.91 | 6.46 | 6.02 | 7.06 | 77.77 |
| Ext. Usage | 0.66 | 0.51 | 0.56 | 0.54 | 0.39 | 0.38 | 0.39 | 0.63 | 0.61 | 0.63 | 0.64 | 0.66 | 6.60 |
| Misc. Equip. | 16.76 | 17.46 | 14.78 | 15.98 | 19.43 | 13.57 | 8.82 | 8.63 | 16.59 | 19.96 | 17.08 | 10.66 | 179.72 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 17.65 | 18.26 | 16.21 | 17.09 | 20.41 | 14.38 | 9.66 | 9.32 | 17.40 | 20.72 | 18.13 | 12.27 | 191.51 |
| **Total** | 51.49 | 52.41 | 47.06 | 49.98 | 63.72 | 59.29 | 54.57 | 49.28 | 70.42 | 62.19 | 52.29 | 39.33 | 652.03 |

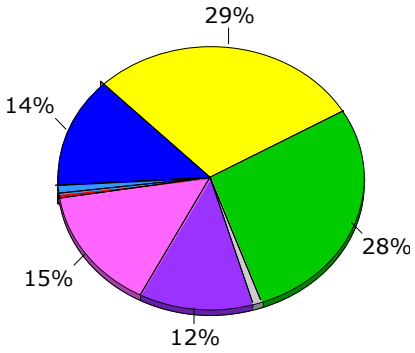
**Gas Consumption (Btu x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 379.9 | 296.4 | 206.2 | 129.5 | 33.4 | 11.3 | 8.1 | 9.7 | 15.7 | 69.4 | 150.5 | 318.6 | 1,628.7 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 114.4 | 120.9 | 101.7 | 109.1 | 120.2 | 81.6 | 53.0 | 49.3 | 87.2 | 108.7 | 98.7 | 70.2 | 1,114.9 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 23.4 | 24.7 | 19.5 | 22.1 | 27.3 | 13.0 | 0.1 | 0.1 | 20.8 | 28.5 | 23.4 | 13.1 | 216.0 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 517.7 | 442.0 | 327.4 | 260.7 | 180.9 | 105.9 | 61.3 | 59.1 | 123.6 | 206.6 | 272.6 | 401.9 | 2,959.6 |

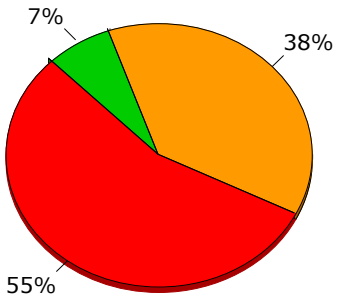
**Annual Energy Consumption by Enduse**

| | Electricity kWh (x000) | Natural Gas MBtu | Steam Btu | Chilled Water Btu |
|---|---|---|---|---|
| Space Cool | 89.00 | - | - | - |
| Heat Reject. | 6.71 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 3.13 | 1,628.7 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 1,114.9 | - | - |
| Vent. Fans | 97.59 | - | - | - |
| Pumps & Aux. | 77.77 | - | - | - |
| Ext. Usage | 6.60 | - | - | - |
| Misc. Equip. | 179.72 | 216.0 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 191.51 | - | - | - |
| **Total** | 652.03 | 2,959.6 | - | - |



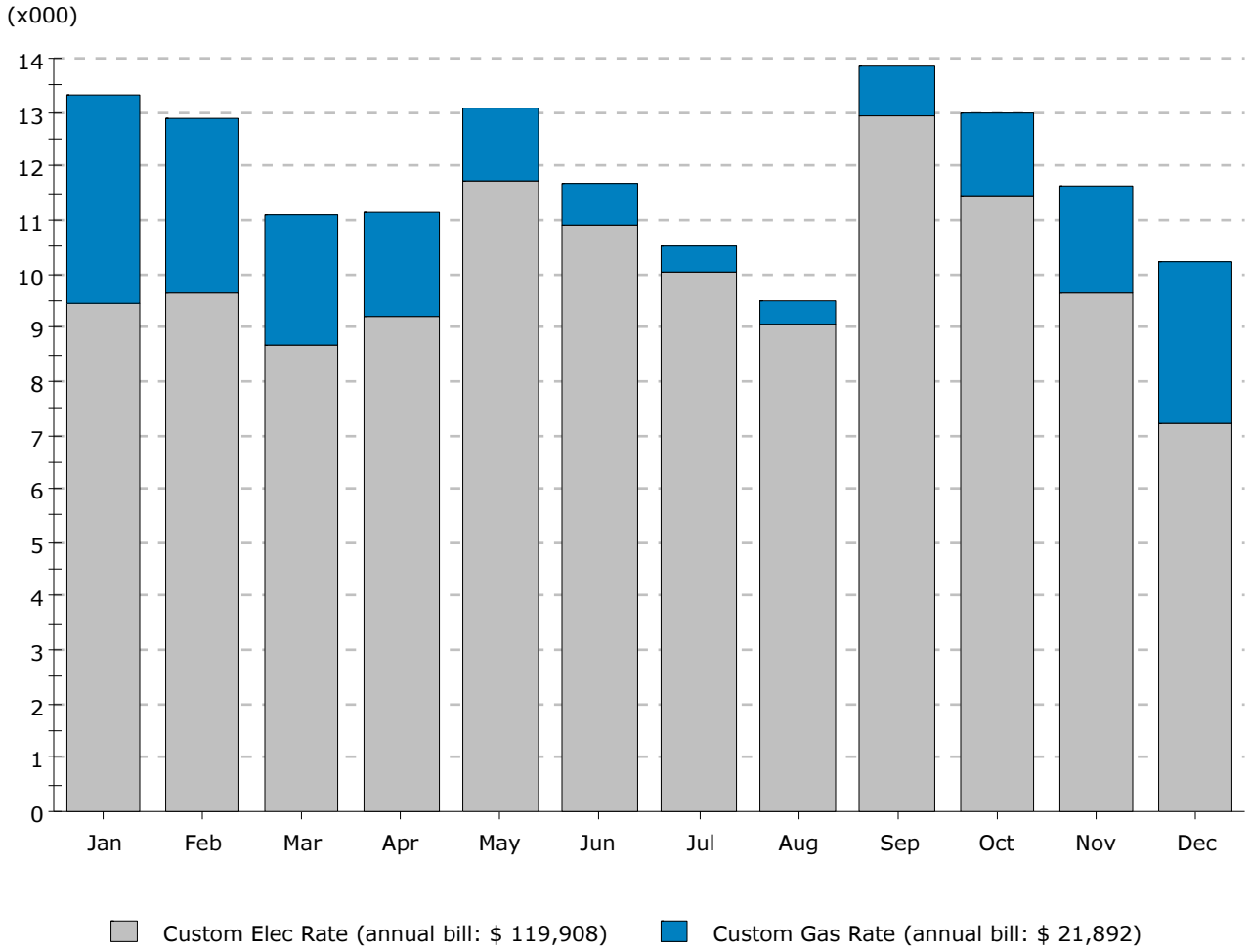




**Electricity**

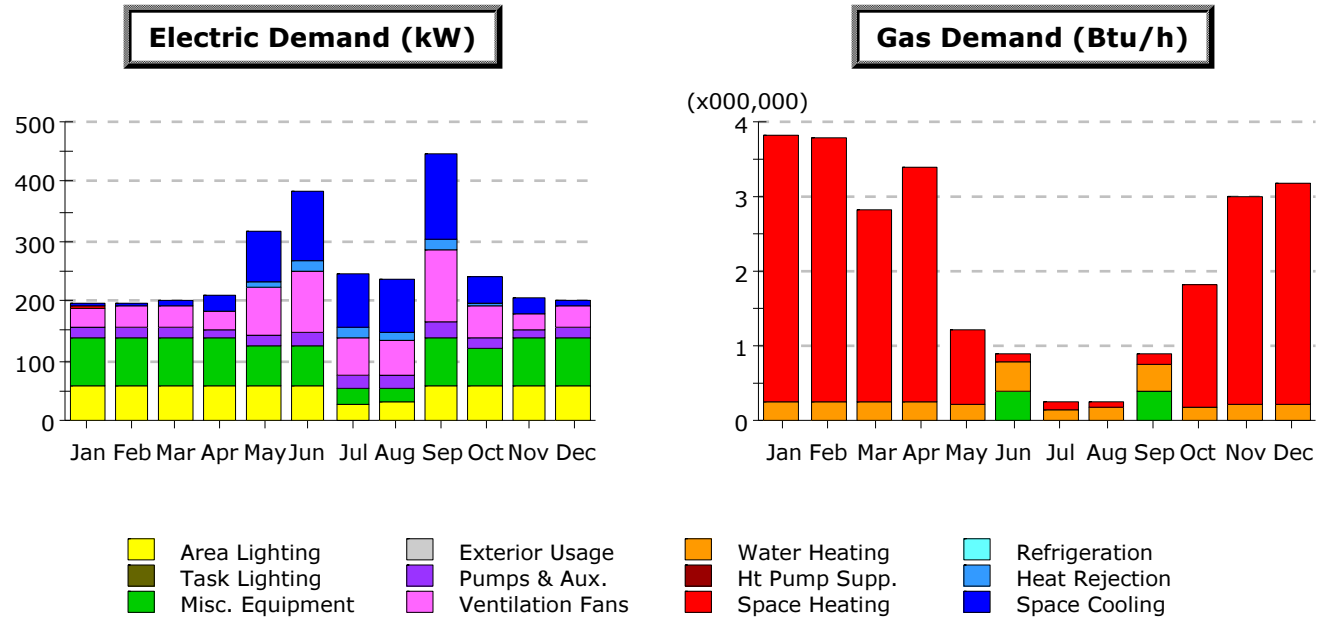



**Natural Gas**

## Monthly Utility Bills ($)




**Total Annual Bill Across All Rates: $ 141,800**




**Electric Demand (kW)**

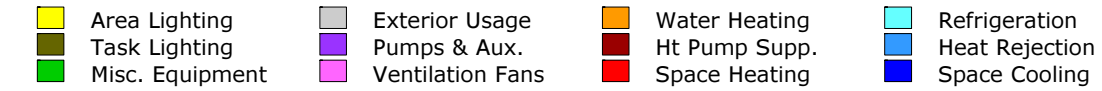
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 5.7 | 5.7 | 10.1 | 27.1 | 85.5 | 119.3 | 90.5 | 89.9 | 140.5 | 45.1 | 28.5 | 8.5 | 656.5 |
| Heat Reject. | - | - | - | - | 10.1 | 15.3 | 15.7 | 13.8 | 18.7 | 4.7 | 0.4 | - | 78.6 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 1.0 | 1.2 | 0.9 | 0.5 | 0.2 | 0.2 | - | - | 0.3 | 0.3 | 0.4 | 1.0 | 6.0 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 34.2 | 37.5 | 34.9 | 27.0 | 79.0 | 102.0 | 64.8 | 61.1 | 122.7 | 51.2 | 25.2 | 35.3 | 674.7 |
| Pumps & Aux. | 15.0 | 15.4 | 14.8 | 14.9 | 19.8 | 25.5 | 23.0 | 19.9 | 24.9 | 17.6 | 15.1 | 14.8 | 220.7 |
| Ext. Usage | - | - | - | - | - | - | - | 0.3 | - | - | - | - | 0.3 |
| Misc. Equip. | 80.8 | 79.7 | 80.8 | 79.7 | 64.4 | 64.4 | 24.0 | 24.3 | 79.7 | 63.3 | 77.8 | 80.8 | 799.8 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 28.1 | 29.1 | 59.2 | 59.2 | 59.2 | 59.2 | 649.3 |
| **Total** | 195.9 | 198.6 | 200.8 | 208.4 | 318.2 | 386.0 | 246.1 | 238.4 | 445.9 | 241.5 | 206.6 | 199.6 | 3,085.9 |

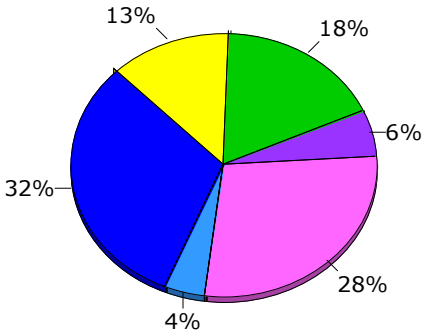
**Gas Demand (Btu/h x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 3.59 | 3.55 | 2.59 | 3.14 | 1.01 | 0.11 | 0.11 | 0.08 | 0.17 | 1.63 | 2.81 | 2.95 | 21.74 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 0.23 | 0.24 | 0.24 | 0.23 | 0.22 | 0.40 | 0.15 | 0.17 | 0.36 | 0.19 | 0.20 | 0.22 | 2.85 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | - | - | 0.38 | 0.00 | 0.00 | 0.00 | 0.79 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 3.83 | 3.79 | 2.83 | 3.38 | 1.23 | 0.89 | 0.27 | 0.25 | 0.91 | 1.83 | 3.02 | 3.17 | 25.38 |

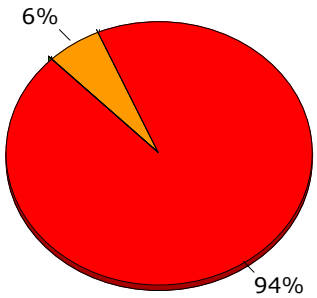
**Annual Peak Demand by Enduse**

| | Electricity kW | Natural Gas Btu/h (x000) | Steam Btu/h | Chilled Water Btu/h |
|---|---|---|---|---|
| Space Cool | 140.50 | - | - | - |
| Heat Reject. | 18.66 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 0.26 | 3,593.1 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 232.0 | - | - |
| Vent. Fans | 122.68 | - | - | - |
| Pumps & Aux. | 24.88 | - | - | - |
| Ext. Usage | - | - | - | - |
| Misc. Equip. | 79.71 | 3.8 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 59.19 | - | - | - |
| **Total** | 445.88 | 3,828.9 | - | - |

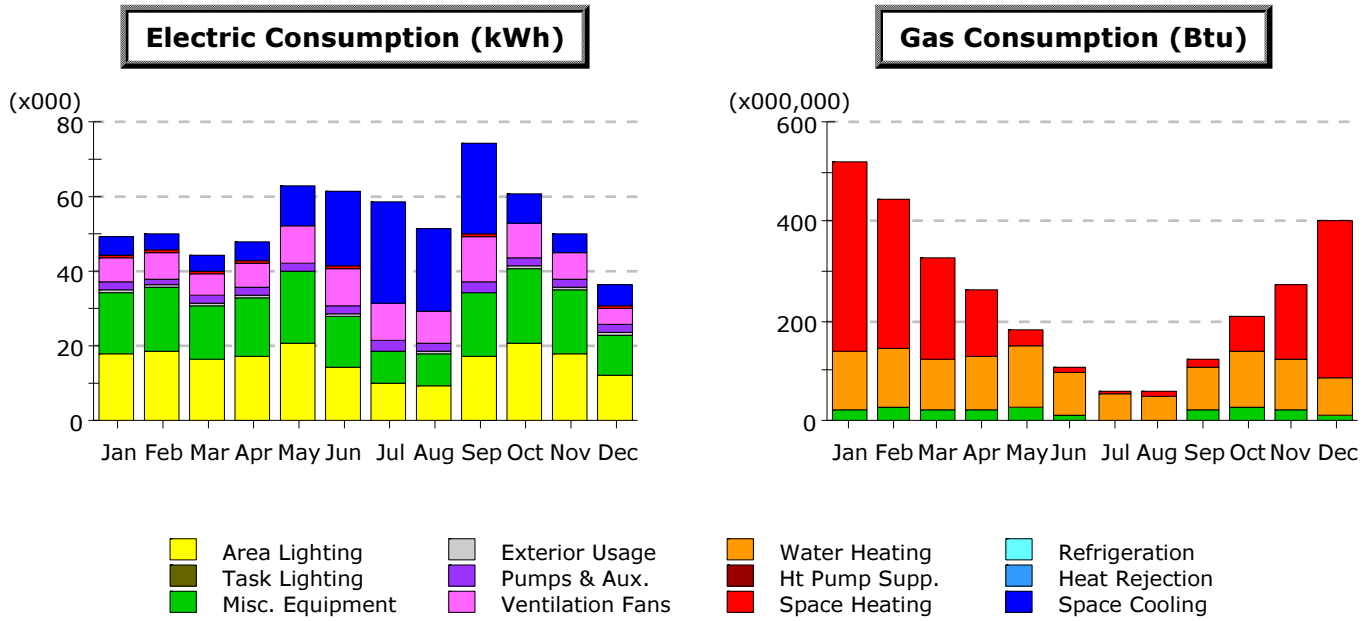



**Electricity**




**Natural Gas**




**Electric Consumption (kWh x000)**

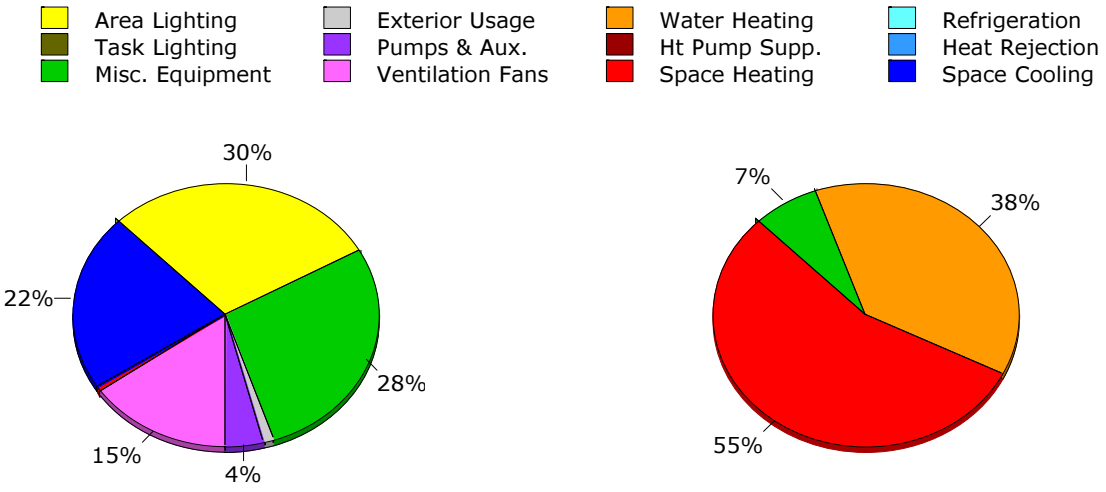
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 4.72 | 4.33 | 4.64 | 4.94 | 11.29 | 20.47 | 26.99 | 22.64 | 24.75 | 7.34 | 4.95 | 5.53 | 142.58 |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 0.61 | 0.49 | 0.43 | 0.31 | 0.10 | 0.04 | 0.03 | 0.03 | 0.05 | 0.18 | 0.30 | 0.56 | 3.13 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 6.46 | 6.98 | 5.95 | 6.81 | 9.47 | 10.34 | 10.00 | 7.98 | 12.46 | 9.55 | 6.98 | 4.60 | 97.59 |
| Pumps & Aux. | 2.10 | 1.91 | 2.02 | 1.96 | 2.13 | 2.36 | 2.62 | 2.48 | 2.52 | 2.07 | 1.96 | 2.14 | 26.28 |
| Ext. Usage | 0.66 | 0.51 | 0.56 | 0.54 | 0.39 | 0.38 | 0.39 | 0.63 | 0.61 | 0.63 | 0.64 | 0.66 | 6.60 |
| Misc. Equip. | 16.76 | 17.46 | 14.78 | 15.98 | 19.43 | 13.57 | 8.82 | 8.63 | 16.59 | 19.96 | 17.08 | 10.66 | 179.72 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 17.65 | 18.26 | 16.21 | 17.09 | 20.41 | 14.38 | 9.66 | 9.32 | 17.40 | 20.72 | 18.13 | 12.27 | 191.51 |
| **Total** | 48.98 | 49.95 | 44.58 | 47.63 | 63.21 | 61.54 | 58.51 | 51.70 | 74.39 | 60.45 | 50.03 | 36.42 | 647.40 |

**Gas Consumption (Btu x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 379.9 | 296.4 | 206.2 | 129.5 | 33.4 | 11.3 | 8.1 | 9.7 | 15.7 | 69.4 | 150.5 | 318.6 | 1,628.7 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 114.4 | 120.9 | 101.7 | 109.1 | 120.2 | 81.6 | 53.0 | 49.3 | 87.2 | 108.7 | 98.7 | 70.2 | 1,114.9 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 23.4 | 24.7 | 19.5 | 22.1 | 27.3 | 13.0 | 0.1 | 0.1 | 20.8 | 28.5 | 23.4 | 13.1 | 216.0 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 517.7 | 442.0 | 327.4 | 260.7 | 180.9 | 105.9 | 61.3 | 59.1 | 123.6 | 206.6 | 272.6 | 401.9 | 2,959.6 |

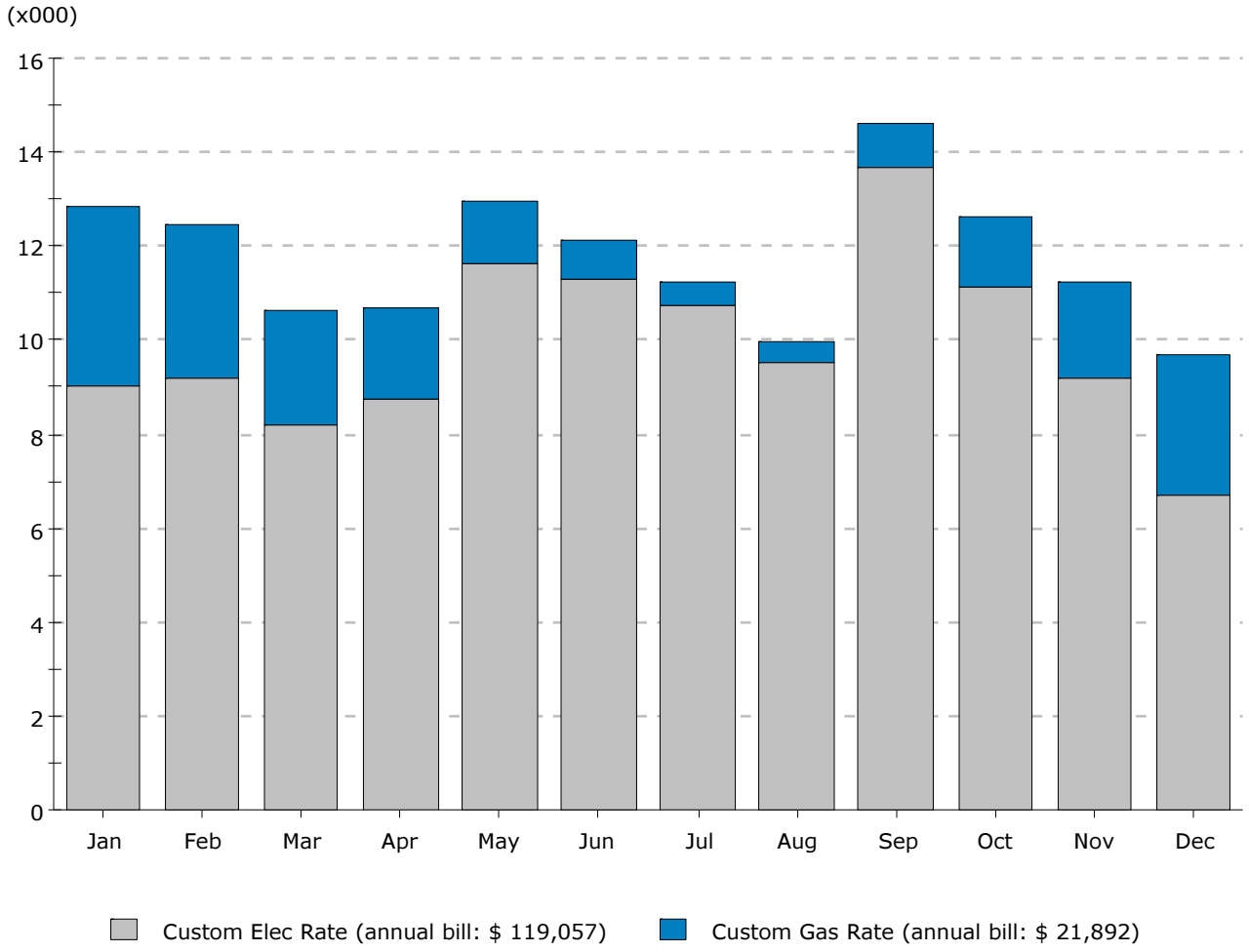
**Annual Energy Consumption by Enduse**

| | Electricity kWh (x000) | Natural Gas MBtu | Steam Btu | Chilled Water Btu |
|---|---|---|---|---|
| Space Cool | 142.58 | - | - | - |
| Heat Reject. | - | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 3.13 | 1,628.7 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 1,114.9 | - | - |
| Vent. Fans | 97.59 | - | - | - |
| Pumps & Aux. | 26.28 | - | - | - |
| Ext. Usage | 6.60 | - | - | - |
| Misc. Equip. | 179.72 | 216.0 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 191.51 | - | - | - |
| **Total** | 647.40 | 2,959.6 | - | - |

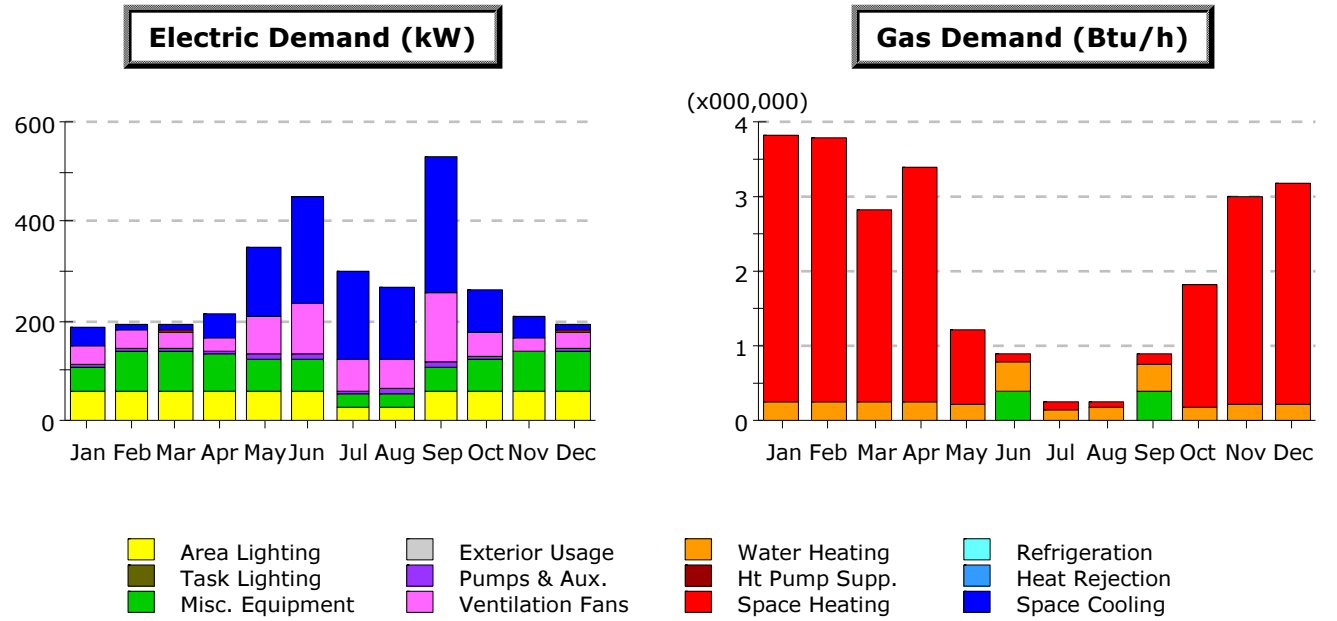



**Electricity** **Natural Gas**

## Monthly Utility Bills ($)




**Total Annual Bill Across All Rates: $ 140,949**




**Electric Demand (kW)**

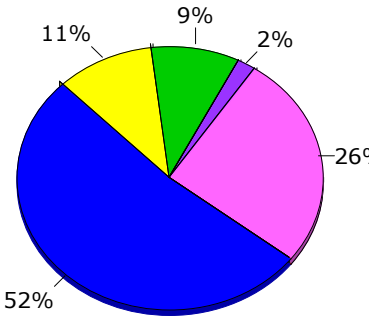
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 35.6 | 8.7 | 15.7 | 44.7 | 134.7 | 214.2 | 175.3 | 146.1 | 275.7 | 83.8 | 44.0 | 13.2 | 1,191.6 |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 1.1 | 1.2 | 0.9 | 0.4 | 0.2 | 0.2 | - | - | 0.2 | 0.2 | 0.4 | 1.0 | 5.8 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 39.7 | 37.5 | 34.9 | 27.8 | 79.0 | 102.0 | 64.8 | 61.1 | 137.6 | 48.0 | 25.2 | 35.3 | 692.8 |
| Pumps & Aux. | 4.3 | 4.2 | 3.7 | 3.9 | 8.6 | 10.3 | 7.8 | 8.8 | 10.8 | 6.6 | 3.9 | 3.7 | 76.6 |
| Ext. Usage | 0.6 | - | - | - | - | - | - | 0.3 | 0.3 | - | - | - | 1.2 |
| Misc. Equip. | 49.7 | 79.7 | 80.8 | 76.8 | 64.4 | 64.4 | 24.0 | 24.3 | 49.7 | 63.3 | 77.8 | 80.8 | 735.8 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 57.0 | 59.2 | 59.2 | 59.2 | 59.2 | 59.2 | 28.1 | 29.1 | 57.0 | 59.2 | 59.2 | 59.2 | 644.8 |
| **Total** | 187.9 | 190.4 | 195.2 | 212.8 | 346.1 | 450.4 | 300.0 | 269.7 | 531.3 | 261.2 | 210.5 | 193.0 | 3,348.6 |

**Gas Demand (Btu/h x000,000)**

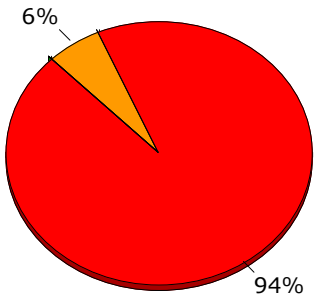
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 3.59 | 3.55 | 2.59 | 3.14 | 1.01 | 0.11 | 0.11 | 0.08 | 0.17 | 1.63 | 2.81 | 2.95 | 21.74 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 0.23 | 0.24 | 0.24 | 0.23 | 0.22 | 0.40 | 0.15 | 0.17 | 0.36 | 0.19 | 0.20 | 0.22 | 2.85 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | - | - | 0.38 | 0.00 | 0.00 | 0.00 | 0.79 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 3.83 | 3.79 | 2.83 | 3.38 | 1.23 | 0.89 | 0.27 | 0.25 | 0.91 | 1.83 | 3.02 | 3.17 | 25.38 |

**Annual Peak Demand by Enduse**

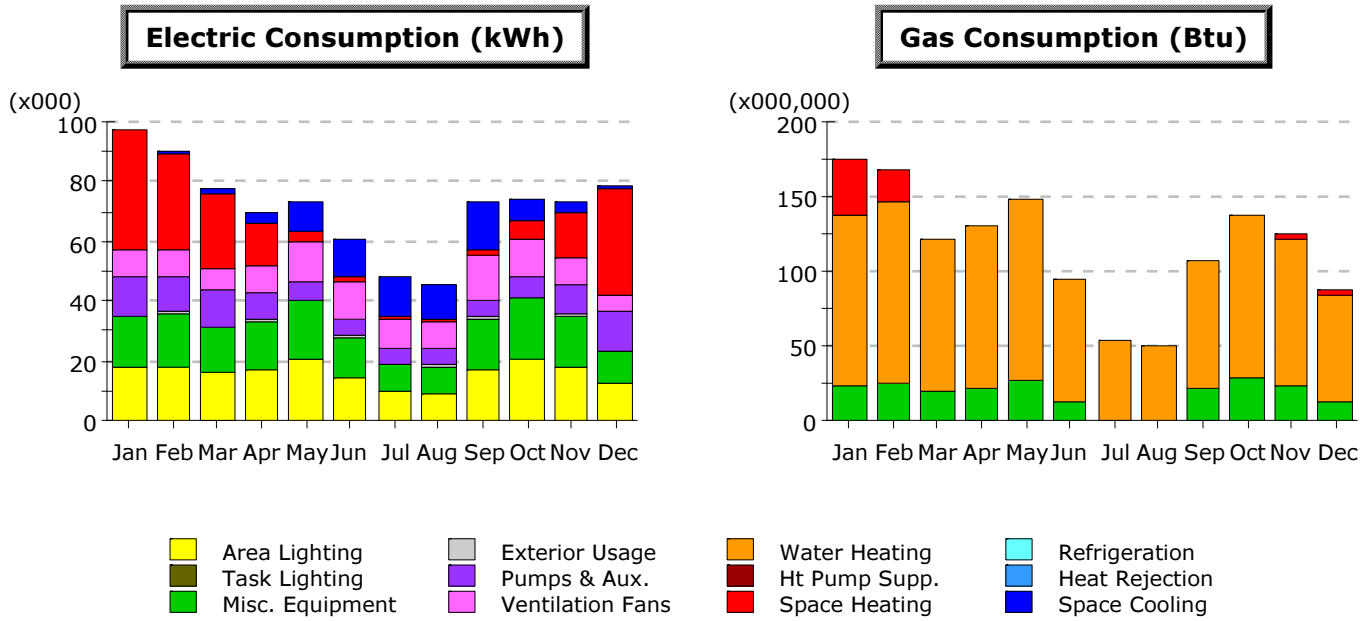
| | Electricity kW | Natural Gas Btu/h (x000) | Steam Btu/h | Chilled Water Btu/h |
|---|---|---|---|---|
| Space Cool | 275.67 | - | - | - |
| Heat Reject. | - | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 0.20 | 3,593.1 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 232.0 | - | - |
| Vent. Fans | 137.64 | - | - | - |
| Pumps & Aux. | 10.82 | - | - | - |
| Ext. Usage | 0.31 | - | - | - |
| Misc. Equip. | 49.72 | 3.8 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 56.97 | - | - | - |
| **Total** | 531.33 | 3,828.9 | - | - |


**Electricity**




**Natural Gas**




**Electric Consumption (kWh x000)**

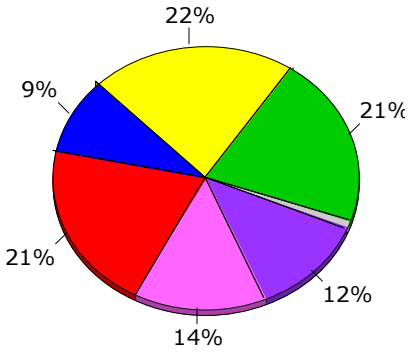
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 0.64 | 1.21 | 1.76 | 3.98 | 10.03 | 12.74 | 12.97 | 11.29 | 16.06 | 7.18 | 2.99 | 0.93 | 81.78 |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 40.24 | 32.36 | 24.75 | 14.30 | 3.40 | 1.40 | 0.88 | 1.35 | 1.35 | 6.59 | 15.60 | 35.26 | 177.50 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 8.10 | 8.75 | 7.19 | 8.81 | 13.55 | 12.79 | 10.15 | 8.91 | 15.49 | 12.45 | 8.73 | 5.37 | 120.31 |
| Pumps & Aux. | 13.58 | 11.76 | 12.40 | 8.95 | 6.35 | 5.49 | 4.99 | 5.31 | 5.49 | 6.95 | 9.84 | 13.29 | 104.39 |
| Ext. Usage | 0.66 | 0.51 | 0.56 | 0.54 | 0.39 | 0.38 | 0.39 | 0.63 | 0.61 | 0.63 | 0.64 | 0.66 | 6.60 |
| Misc. Equip. | 16.76 | 17.46 | 14.78 | 15.98 | 19.43 | 13.57 | 8.82 | 8.63 | 16.59 | 19.96 | 17.08 | 10.66 | 179.72 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 17.65 | 18.26 | 16.21 | 17.09 | 20.41 | 14.38 | 9.66 | 9.32 | 17.40 | 20.72 | 18.13 | 12.27 | 191.51 |
| **Total** | 97.64 | 90.31 | 77.64 | 69.66 | 73.56 | 60.75 | 47.86 | 45.45 | 72.99 | 74.49 | 73.01 | 78.44 | 861.81 |

**Gas Consumption (Btu x000,000)**

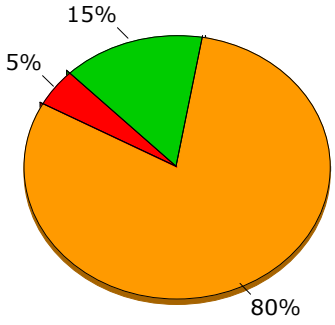
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 36.9 | 21.9 | - | - | - | - | - | - | - | - | 2.3 | 3.4 | 64.4 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 114.4 | 120.9 | 101.7 | 109.1 | 120.2 | 81.6 | 53.1 | 49.3 | 87.2 | 108.7 | 98.7 | 70.2 | 1,115.0 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 23.4 | 24.7 | 19.5 | 22.1 | 27.3 | 13.0 | 0.1 | 0.1 | 20.8 | 28.5 | 23.4 | 13.1 | 216.0 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 174.7 | 167.5 | 121.2 | 131.2 | 147.4 | 94.6 | 53.1 | 49.4 | 108.0 | 137.3 | 124.3 | 86.7 | 1,395.4 |

**Annual Energy Consumption by Enduse**

| | Electricity kWh (x000) | Natural Gas MBtu | Steam Btu | Chilled Water Btu |
|---|---|---|---|---|
| Space Cool | 81.78 | - | - | - |
| Heat Reject. | - | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | 177.50 | 64.4 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 1,115.0 | - | - |
| Vent. Fans | 120.31 | - | - | - |
| Pumps & Aux. | 104.39 | - | - | - |
| Ext. Usage | 6.60 | - | - | - |
| Misc. Equip. | 179.72 | 216.0 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 191.51 | - | - | - |
| **Total** | 861.81 | 1,395.4 | - | - |

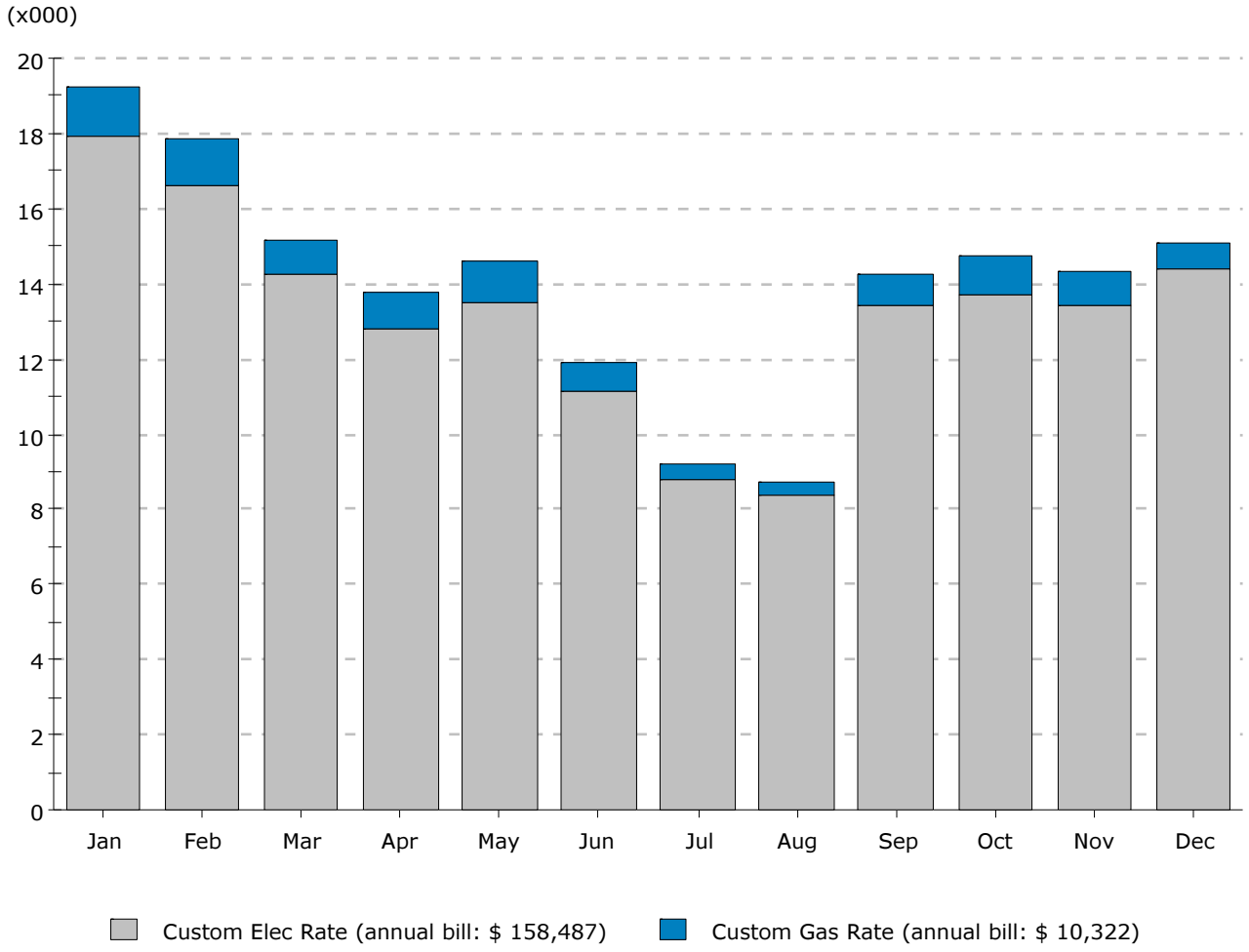




**Electricity**

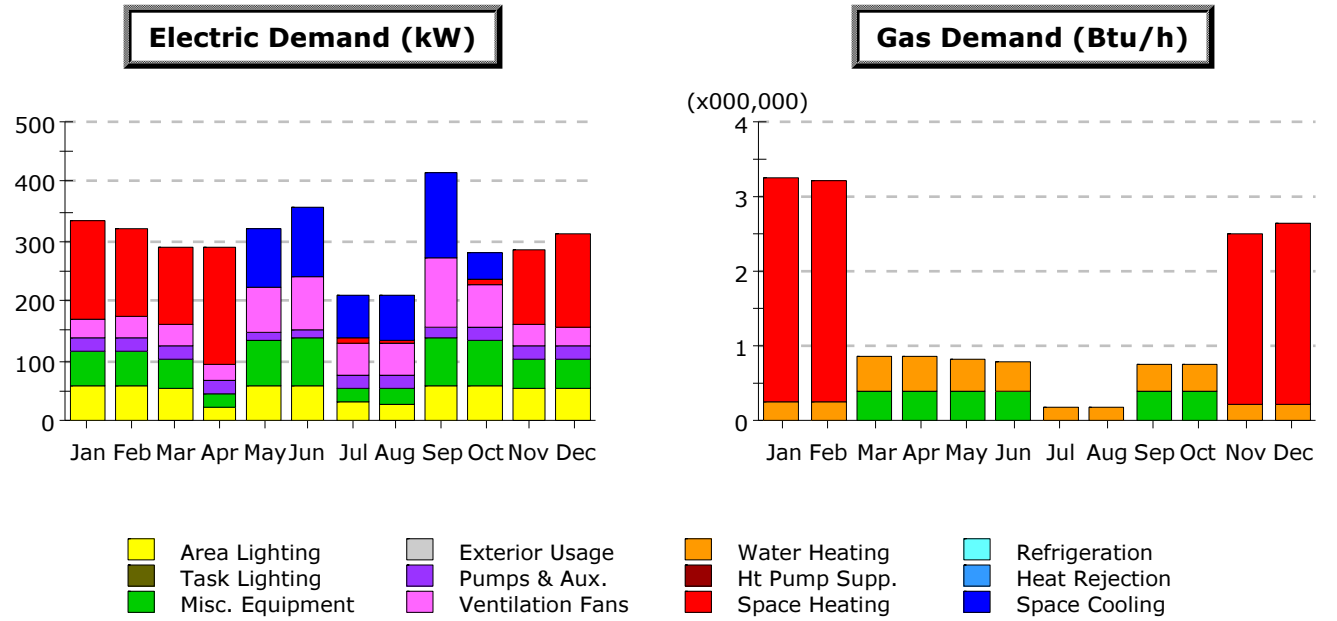



**Natural Gas**

## Monthly Utility Bills ($)




**Total Annual Bill Across All Rates: $ 168,809**




**Electric Demand (kW)**

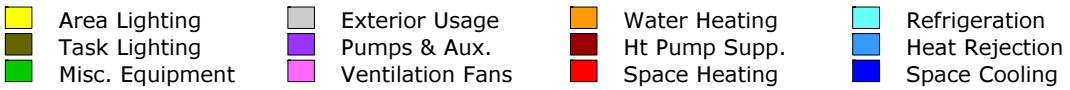
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | 96.8 | 116.6 | 74.0 | 74.2 | 144.1 | 46.8 | - | - | 552.4 |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 165.9 | 151.3 | 133.2 | 196.8 | - | - | 7.7 | 8.6 | - | 9.6 | 128.2 | 155.3 | 956.6 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 33.4 | 34.7 | 34.8 | 24.6 | 77.3 | 90.3 | 52.5 | 53.0 | 116.5 | 69.3 | 35.4 | 34.5 | 656.3 |
| Pumps & Aux. | 20.3 | 20.2 | 20.1 | 20.9 | 13.8 | 14.9 | 22.7 | 22.7 | 15.6 | 21.5 | 20.1 | 20.2 | 233.3 |
| Ext. Usage | - | - | - | - | - | - | - | 0.3 | - | - | - | - | 0.3 |
| Misc. Equip. | 57.9 | 57.9 | 49.9 | 22.2 | 73.8 | 77.8 | 24.3 | 24.3 | 79.7 | 76.8 | 49.9 | 49.9 | 644.5 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 59.2 | 59.2 | 53.8 | 24.2 | 59.2 | 59.2 | 29.1 | 27.1 | 59.2 | 59.2 | 53.8 | 53.8 | 597.0 |
| **Total** | 336.7 | 323.3 | 291.7 | 288.8 | 320.9 | 358.9 | 210.3 | 210.3 | 415.2 | 283.2 | 287.4 | 313.8 | 3,640.5 |

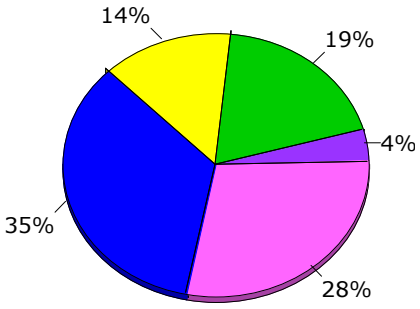
**Gas Demand (Btu/h x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 3.00 | 2.96 | - | - | - | - | - | - | - | - | 2.29 | 2.42 | 10.67 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 0.23 | 0.24 | 0.48 | 0.47 | 0.43 | 0.40 | 0.18 | 0.17 | 0.36 | 0.37 | 0.20 | 0.22 | 3.75 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0.00 | 0.00 | 0.38 | 0.38 | 0.38 | 0.38 | - | - | 0.38 | 0.38 | 0.00 | 0.00 | 2.29 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 3.23 | 3.20 | 0.86 | 0.85 | 0.81 | 0.78 | 0.18 | 0.17 | 0.74 | 0.75 | 2.49 | 2.64 | 16.70 |

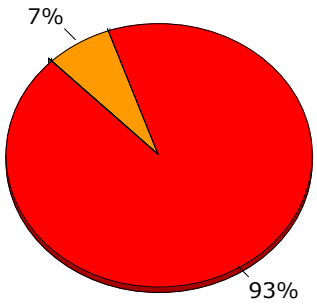
**Annual Peak Demand by Enduse**

| | Electricity kW | Natural Gas Btu/h (x000) | Steam Btu/h | Chilled Water Btu/h |
|---|---|---|---|---|
| Space Cool | 144.12 | - | - | - |
| Heat Reject. | - | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | - | 2,997.4 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 232.0 | - | - |
| Vent. Fans | 116.49 | - | - | - |
| Pumps & Aux. | 15.63 | - | - | - |
| Ext. Usage | - | - | - | - |
| Misc. Equip. | 79.71 | 3.8 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 59.19 | - | - | - |
| **Total** | 415.16 | 3,233.2 | - | - |

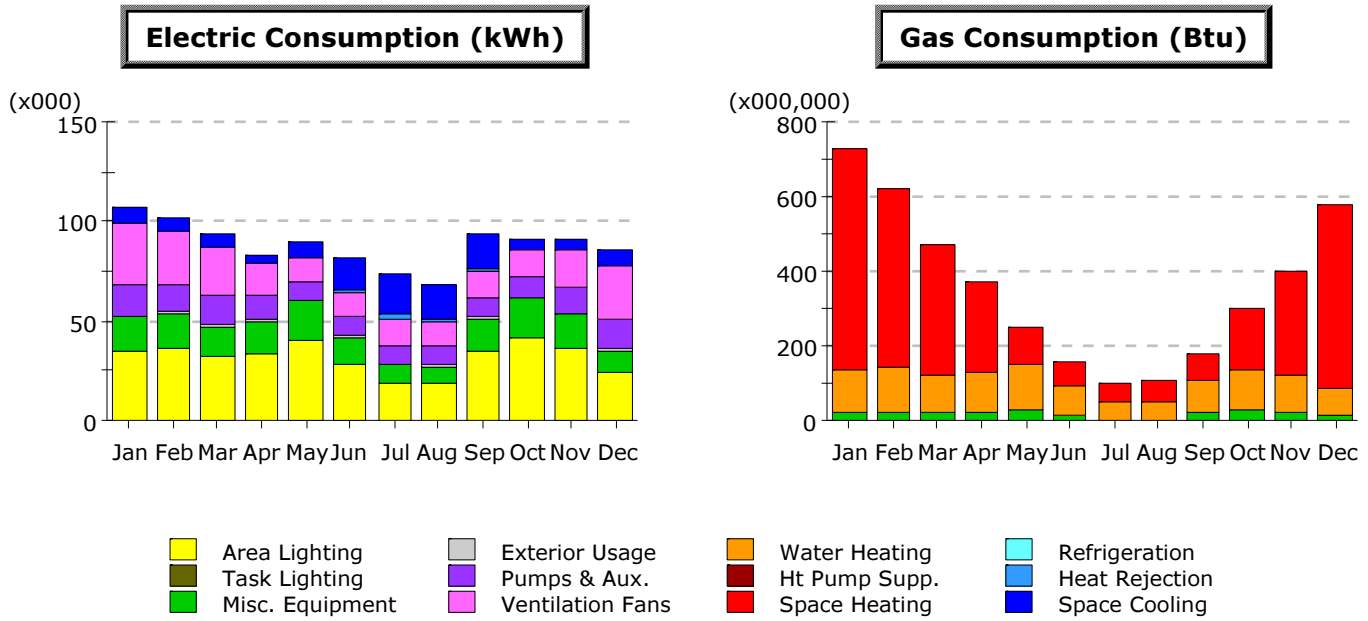



**Electricity**




**Natural Gas**




**Electric Consumption (kWh x000)**

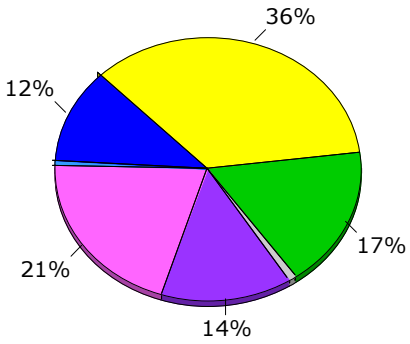
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 7.8 | 6.4 | 6.8 | 4.7 | 8.0 | 15.5 | 21.0 | 18.1 | 17.6 | 5.6 | 5.1 | 7.3 | 123.8 |
| Heat Reject. | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 1.1 | 1.5 | 1.4 | 1.1 | 0.2 | 0.0 | 0.0 | 5.9 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 30.3 | 25.9 | 24.0 | 16.1 | 11.7 | 12.8 | 13.6 | 12.2 | 13.7 | 12.7 | 18.1 | 26.4 | 217.4 |
| Pumps & Aux. | 16.2 | 14.7 | 15.6 | 12.3 | 9.3 | 9.4 | 9.5 | 9.1 | 9.6 | 10.7 | 13.7 | 15.6 | 145.7 |
| Ext. Usage | 0.8 | 0.6 | 0.7 | 0.6 | 0.5 | 0.4 | 0.5 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 7.8 |
| Misc. Equip. | 16.8 | 17.5 | 14.8 | 16.0 | 19.4 | 13.6 | 8.8 | 8.6 | 16.6 | 20.0 | 17.1 | 10.7 | 179.7 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 35.0 | 36.2 | 32.1 | 33.9 | 40.4 | 28.5 | 19.1 | 18.5 | 34.5 | 41.0 | 35.9 | 24.3 | 379.4 |
| **Total** | 106.7 | 101.3 | 93.9 | 83.6 | 89.8 | 81.3 | 74.1 | 68.7 | 93.9 | 90.8 | 90.7 | 85.0 | 1,059.8 |

**Gas Consumption (Btu x000,000)**

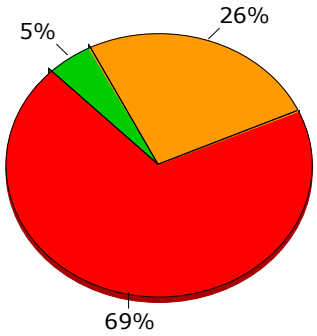
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 592.2 | 476.1 | 353.6 | 238.0 | 103.0 | 65.6 | 44.4 | 55.4 | 69.7 | 165.1 | 274.8 | 497.2 | 2,935.1 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 114.2 | 120.7 | 101.4 | 108.9 | 119.8 | 81.4 | 52.9 | 49.2 | 86.9 | 108.4 | 98.4 | 70.1 | 1,112.3 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 23.4 | 24.7 | 19.5 | 22.1 | 27.3 | 13.0 | 0.1 | 0.1 | 20.8 | 28.5 | 23.4 | 13.1 | 216.0 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 729.8 | 621.5 | 474.6 | 369.0 | 250.1 | 160.0 | 97.4 | 104.8 | 177.4 | 302.1 | 396.6 | 580.4 | 4,263.4 |

**Annual Energy Consumption by Enduse**

| | Electricity kWh (x000) | Natural Gas MBtu | Steam Btu | Chilled Water Btu |
|---|---|---|---|---|
| Space Cool | 123.8 | - | - | - |
| Heat Reject. | 5.9 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | - | 2,935.1 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 1,112.3 | - | - |
| Vent. Fans | 217.4 | - | - | - |
| Pumps & Aux. | 145.7 | - | - | - |
| Ext. Usage | 7.8 | - | - | - |
| Misc. Equip. | 179.7 | 216.0 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 379.4 | - | - | - |
| **Total** | 1,059.8 | 4,263.4 | - | - |

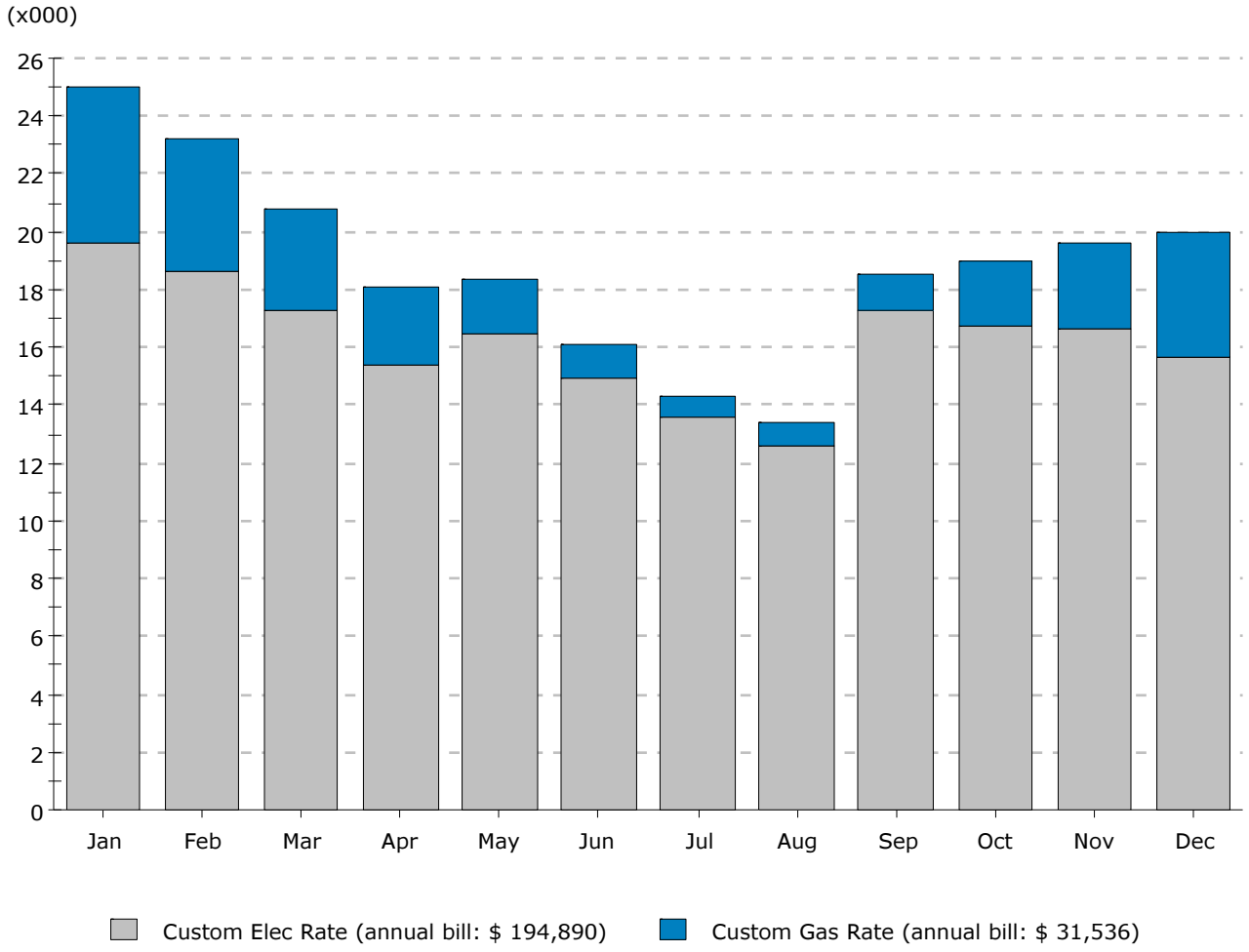




**Electricity**

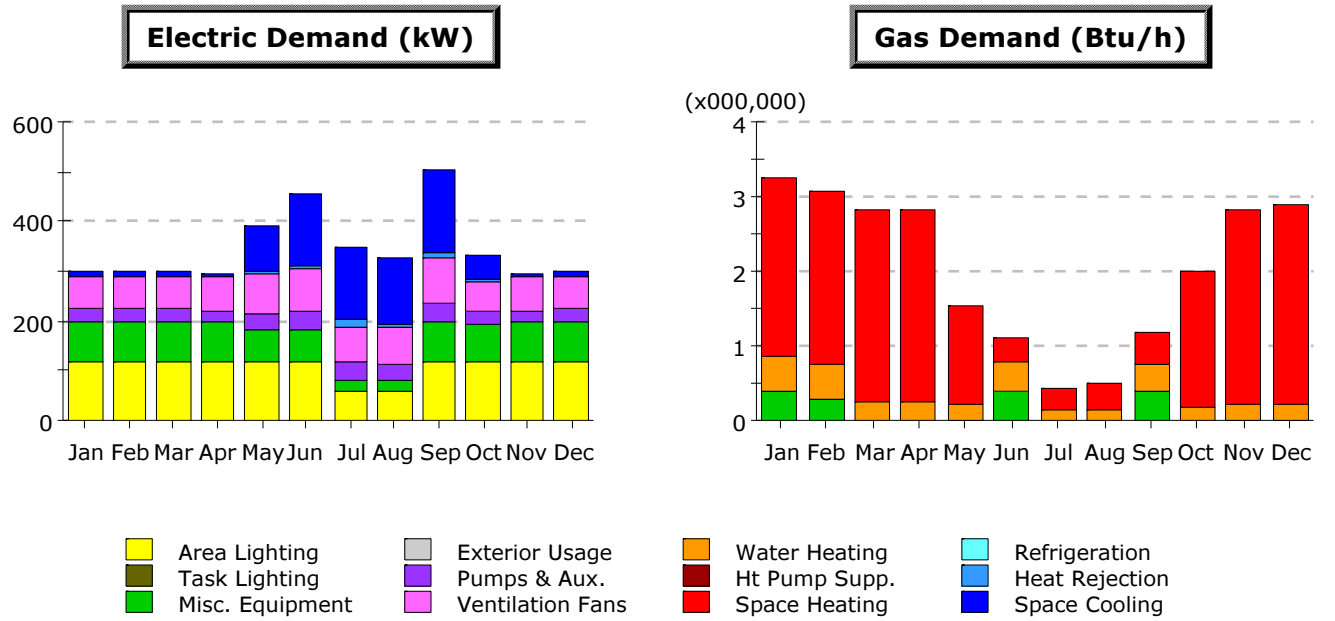



**Natural Gas**

## Monthly Utility Bills ($)




**Total Annual Bill Across All Rates: $ 226,426**




**Electric Demand (kW)**

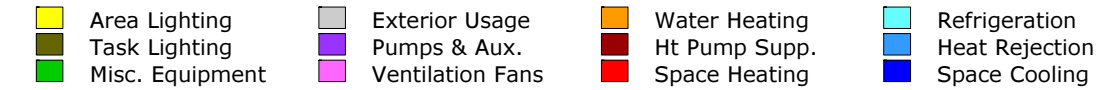
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | 9.9 | 9.1 | 9.1 | 3.7 | 95.0 | 142.5 | 143.9 | 134.0 | 165.9 | 45.9 | 5.7 | 9.1 | 773.8 |
| Heat Reject. | - | - | - | - | 5.2 | 5.2 | 12.9 | 5.2 | 10.9 | 3.2 | - | - | 42.5 |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Vent. Fans | 67.4 | 66.8 | 66.9 | 66.9 | 79.4 | 88.9 | 70.5 | 72.8 | 94.1 | 59.9 | 66.9 | 67.4 | 868.0 |
| Pumps & Aux. | 24.6 | 24.5 | 24.5 | 24.7 | 31.2 | 37.4 | 36.4 | 31.6 | 38.0 | 26.6 | 24.5 | 24.5 | 348.5 |
| Ext. Usage | - | - | - | - | - | - | - | 0.4 | - | - | - | - | 0.4 |
| Misc. Equip. | 80.8 | 80.8 | 80.8 | 79.7 | 64.4 | 64.4 | 24.3 | 24.3 | 79.7 | 76.8 | 79.7 | 80.8 | 816.4 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | 117.3 | 117.3 | 117.3 | 117.3 | 117.3 | 117.3 | 57.7 | 57.7 | 117.3 | 117.3 | 117.3 | 117.3 | 1,288.3 |
| **Total** | 300.0 | 298.6 | 298.6 | 292.2 | 392.5 | 455.7 | 345.8 | 326.0 | 505.9 | 329.6 | 294.1 | 299.1 | 4,137.8 |

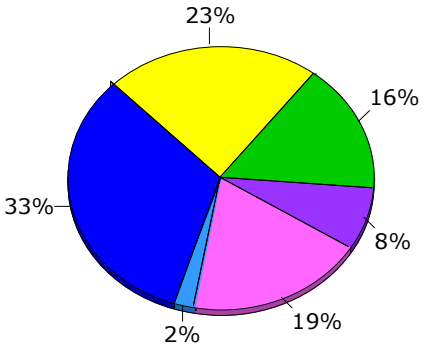
**Gas Demand (Btu/h x000,000)**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Space Cool | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heat Reject. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Space Heat | 2.40 | 2.31 | 2.58 | 2.57 | 1.31 | 0.33 | 0.29 | 0.37 | 0.44 | 1.80 | 2.61 | 2.67 | 19.68 |
| HP Supp. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Hot Water | 0.46 | 0.48 | 0.24 | 0.23 | 0.22 | 0.40 | 0.15 | 0.15 | 0.36 | 0.19 | 0.20 | 0.22 | 3.29 |
| Vent. Fans | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Pumps & Aux. | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ext. Usage | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Misc. Equip. | 0.38 | 0.28 | 0.00 | 0.00 | 0.00 | 0.38 | - | - | 0.38 | 0.00 | 0.00 | 0.00 | 1.44 |
| Task Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Area Lights | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total** | 3.24 | 3.07 | 2.82 | 2.81 | 1.53 | 1.11 | 0.45 | 0.52 | 1.18 | 1.99 | 2.82 | 2.89 | 24.41 |

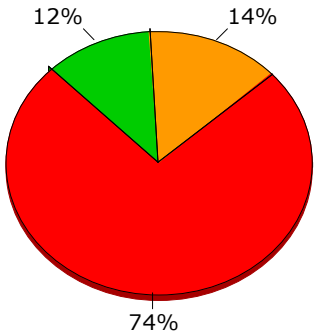
**Annual Peak Demand by Enduse**

| | Electricity kW | Natural Gas Btu/h (x000) | Steam Btu/h | Chilled Water Btu/h |
|---|---|---|---|---|
| Space Cool | 165.89 | - | - | - |
| Heat Reject. | 10.87 | - | - | - |
| Refrigeration | - | - | - | - |
| Space Heat | - | 2,395.6 | - | - |
| HP Supp. | - | - | - | - |
| Hot Water | - | 460.1 | - | - |
| Vent. Fans | 94.14 | - | - | - |
| Pumps & Aux. | 37.99 | - | - | - |
| Ext. Usage | - | - | - | - |
| Misc. Equip. | 79.71 | 379.5 | - | - |
| Task Lights | - | - | - | - |
| Area Lights | 117.27 | - | - | - |
| **Total** | 505.87 | 3,235.2 | - | - |




**Electricity**




**Natural Gas**

## Appendix

# Space Design Load Summary for RTU-1&2

Project Name: FULLER SCHOOL 10/03/2019
Prepared by: Garcia Galuska DeSousa consulting engineers 03:26PM

| TABLE 1.1.A. Component Loads For Space "1214 OFFICE" In Zone "VAV-1-1" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 140 ft² | 0 | - | 140 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 98 W | 303 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 210 W | 687 | - | 0 | 0 | - |
| People | 3 | 644 | 615 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 82 | 31 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1715** | **646** | **-** | **0** | **0** |

| TABLE 1.1.B. Envelope Loads For Space "1214 OFFICE" In Zone "VAV-1-1" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 2.1.A. Component Loads For Space "1215 OFFICE" In Zone "VAV-1-2" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 148 ft² | 0 | - | 148 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 104 W | 320 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 222 W | 726 | - | 0 | 0 | - |
| People | 3 | 644 | 615 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 85 | 31 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1775** | **646** | **-** | **0** | **0** |

| TABLE 2.1.B. Envelope Loads For Space "1215 OFFICE" In Zone "VAV-1-2" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 3.1.A. Component Loads For Space "1217 PRACTICE" In Zone "VAV-1-3" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 121 ft² | 0 | - | 121 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 85 W | 262 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 61 W | 198 | - | 0 | 0 | - |
| People | 3 | 776 | 1365 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 62 | 68 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1297** | **1433** | **-** | **0** | **0** |

| TABLE 3.1.B. Envelope Loads For Space "1217 PRACTICE" In Zone "VAV-1-3" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 4.1.A. Component Loads For Space "1218 PRACTICE" In Zone "VAV-1-4" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 104 ft² | 0 | - | 104 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 73 W | 225 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 52 W | 170 | - | 0 | 0 | - |
| People | 3 | 776 | 1365 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 59 | 68 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1229** | **1433** | **-** | **0** | **0** |

| TABLE 4.1.B. Envelope Loads For Space "1218 PRACTICE" In Zone "VAV-1-4" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 5.1.A. Component Loads For Space "1219 ENSEMBLE" In Zone "VAV-1-5" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 160 ft² | 0 | - | 160 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 112 W | 346 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 80 W | 262 | - | 0 | 0 | - |
| People | 5 | 1293 | 2275 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 95 | 114 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1996** | **2389** | **-** | **0** | **0** |

| TABLE 5.1.B. Envelope Loads For Space "1219 ENSEMBLE" In Zone "VAV-1-5" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 6.1.A. Component Loads For Space "1300 LOBBY" In Zone "VAV-1-6" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 188 ft² | 210 | - | 188 ft² | 311 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 862 ft² | 0 | - | 862 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 603 W | 1787 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 100 | 0 | 5% | 16 | 0 |
| **>> Total Zone Loads** | **-** | **2098** | **0** | **-** | **326** | **0** |

| TABLE 6.1.B. Envelope Loads For Space "1300 LOBBY" In Zone "VAV-1-6" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 188 | 0.027 | - | 210 | - | 311 |

| TABLE 7.1.A. Component Loads For Space "1310 CORRIDOR" In Zone "VAV-1-7" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 175 ft² | 6965 | - | 175 ft² | - | - |
| Wall Transmission | 110 ft² | 159 | - | 110 ft² | 422 | - |
| Roof Transmission | 605 ft² | 747 | - | 605 ft² | 1000 | - |
| Window Transmission | 90 ft² | 437 | - | 90 ft² | 2103 | - |
| Skylight Transmission | 85 ft² | 260 | - | 85 ft² | 1255 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 690 ft² | 0 | - | 690 ft² | 457 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 483 W | 1399 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 134 | 135 | - | 531 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 505 | 7 | 5% | 288 | 0 |
| **>> Total Zone Loads** | **-** | **10606** | **142** | **-** | **6055** | **0** |

| TABLE 7.1.B. Envelope Loads For Space "1310 CORRIDOR" In Zone "VAV-1-7" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **E EXPOSURE** | | | | | | |
| WALL | 110 | 0.062 | - | 159 | - | 422 |
| WINDOW 1 | 90 | 0.380 | 0.333 | 437 | 1781 | 2103 |
| **H EXPOSURE** | | | | | | |
| ROOF | 605 | 0.027 | - | 747 | - | 1000 |
| SKYLIGHT | 85 | 0.240 | 0.448 | 260 | 5185 | 1255 |

| TABLE 8.1.A. Component Loads For Space "1060A CORRIDOR (W)" In Zone "VAV-1-8" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1400<br>COOLING OA DB / WB 86.0 °F / 70.4 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 91 ft² | 2845 | - | 91 ft² | - | - |
| Wall Transmission | 259 ft² | 407 | - | 259 ft² | 993 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 91 ft² | 286 | - | 91 ft² | 2127 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1473 ft² | 0 | - | 1473 ft² | 1184 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1031 W | 2986 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 167 | 168 | - | 929 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 335 | 8 | 5% | 262 | 0 |
| **>> Total Zone Loads** | **-** | **7026** | **177** | **-** | **5494** | **0** |

| TABLE 8.1.B. Envelope Loads For Space "1060A CORRIDOR (W)" In Zone "VAV-1-8" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 259 | 0.062 | - | 407 | - | 993 |
| WINDOW 1 | 91 | 0.380 | 0.333 | 286 | 2845 | 2127 |

| TABLE 9.1.A. Component Loads For Space "1220 BAND" In Zone "VAV-1-9" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 151 ft² | 1726 | - | 151 ft² | - | - |
| Wall Transmission | 290 ft² | 297 | - | 290 ft² | 1111 | - |
| Roof Transmission | 6 ft² | 6 | - | 6 ft² | 10 | - |
| Window Transmission | 151 ft² | 720 | - | 151 ft² | 3529 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 846 ft² | 0 | - | 846 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 592 W | 1772 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 423 W | 1364 | - | 0 | 0 | - |
| People | 31 | 5974 | 3720 | 0 | 0 | 0 |
| Infiltration | - | 275 | 302 | - | 1170 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 607 | 201 | 5% | 291 | 0 |
| **>> Total Zone Loads** | **-** | **12742** | **4223** | **-** | **6112** | **0** |

| TABLE 9.1.B. Envelope Loads For Space "1220 BAND" In Zone "VAV-1-9" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **N EXPOSURE** | | | | | | |
| WALL | 276 | 0.062 | - | 279 | - | 1058 |
| WINDOW 1 | 151 | 0.380 | 0.437 | 720 | 1726 | 3529 |
| **E EXPOSURE** | | | | | | |
| WALL | 14 | 0.062 | - | 19 | - | 54 |
| **H EXPOSURE** | | | | | | |
| ROOF | 6 | 0.027 | - | 6 | - | 10 |

| TABLE 10.1.A. Component Loads For Space "1222A/B BAND/CHOR OFFICE" In Zone "VAV-1-10" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 98 ft² | 0 | - | 98 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 147 W | 481 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 56 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1178** | **431** | **-** | **0** | **0** |

| TABLE 10.1.B. Envelope Loads For Space "1222A/B BAND/CHOR OFFICE" In Zone "VAV-1-10" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 11.1.A. Component Loads For Space "1224 CHORUS" In Zone "VAV-1-11" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 2100<br>COOLING OA DB / WB 82.1 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 8 ft² | 3 | - | 8 ft² | 13 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 851 ft² | 0 | - | 851 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 596 W | 1842 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 426 W | 1391 | - | 0 | 0 | - |
| People | 32 | 8274 | 14560 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 575 | 728 | 5% | 1 | 0 |
| **>> Total Zone Loads** | **-** | **12085** | **15288** | **-** | **14** | **0** |

| TABLE 11.1.B. Envelope Loads For Space "1224 CHORUS" In Zone "VAV-1-11" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 8 | 0.027 | - | 3 | - | 13 |

| TABLE 12.1.A. Component Loads For Space "1230 DRAMA CLASSROOM" In Zone "VAV-1-12" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 2100<br>COOLING OA DB / WB 82.1 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 31 ft² | 227 | - | 31 ft² | - | - |
| Wall Transmission | 137 ft² | 136 | - | 137 ft² | 525 | - |
| Roof Transmission | 7 ft² | 3 | - | 7 ft² | 12 | - |
| Window Transmission | 31 ft² | 92 | - | 31 ft² | 724 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 837 ft² | 0 | - | 837 ft² | 490 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 586 W | 1811 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 419 W | 1368 | - | 0 | 0 | - |
| People | 26 | 5583 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 52 | 112 | - | 446 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 464 | 272 | 5% | 110 | 0 |
| **>> Total Zone Loads** | **-** | **9735** | **5714** | **-** | **2307** | **0** |

| TABLE 12.1.B. Envelope Loads For Space "1230 DRAMA CLASSROOM" In Zone "VAV-1-12" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **N EXPOSURE** | | | | | | |
| WALL | 137 | 0.062 | - | 136 | - | 525 |
| WINDOW 1 | 31 | 0.380 | 0.437 | 92 | 227 | 724 |
| **H EXPOSURE** | | | | | | |
| ROOF | 7 | 0.027 | - | 3 | - | 12 |

| TABLE 13.1.A. Component Loads For Space "1232 ART WORKROOM" In Zone "VAV-1-13" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 98 ft² | 0 | - | 98 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 147 W | 481 | - | 0 | 0 | - |
| People | 2 | 433 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 56 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1181** | **431** | **-** | **0** | **0** |

| TABLE 13.1.B. Envelope Loads For Space "1232 ART WORKROOM" In Zone "VAV-1-13" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 14.1.A. Component Loads For Space "1233 ART WORKROOM" In Zone "VAV-1-14" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 68 ft² | 0 | - | 68 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 48 W | 147 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 102 W | 333 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 46 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **956** | **431** | **-** | **0** | **0** |

| TABLE 14.1.B. Envelope Loads For Space "1233 ART WORKROOM" In Zone "VAV-1-14" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 15.1.A. Component Loads For Space "1234 ART" In Zone "VAV-1-15" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 284 ft² | 3758 | - | 284 ft² | - | - |
| Wall Transmission | 262 ft² | 266 | - | 262 ft² | 1004 | - |
| Roof Transmission | 255 ft² | 308 | - | 255 ft² | 422 | - |
| Window Transmission | 284 ft² | 1431 | - | 284 ft² | 6637 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1173 ft² | 0 | - | 1173 ft² | 1135 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 821 W | 2406 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 587 W | 1875 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 377 | 367 | - | 1449 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 780 | 285 | 5% | 532 | 0 |
| **>> Total Zone Loads** | **-** | **16388** | **5982** | **-** | **11179** | **0** |

| TABLE 15.1.B. Envelope Loads For Space "1234 ART" In Zone "VAV-1-15" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NNE EXPOSURE** | | | | | | |
| WALL | 150 | 0.062 | - | 145 | - | 575 |
| WINDOW 1 | 284 | 0.380 | 0.437 | 1431 | 3758 | 6637 |
| **WNW EXPOSURE** | | | | | | |
| WALL | 112 | 0.062 | - | 121 | - | 429 |
| **H EXPOSURE** | | | | | | |
| ROOF | 255 | 0.027 | - | 308 | - | 422 |

**TABLE 16.1.A. Component Loads For Space "1059 LEARNING COMMONS" In Zone "VAV-1-16"**

| | DESIGN COOLING | | | DESIGN HEATING | | |
|---|---|---|---|---|---|---|
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1505 ft² | 0 | - | 1505 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1054 W | 3257 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 753 W | 2460 | - | 0 | 0 | - |
| People | 33 | 7087 | 6765 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 640 | 338 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **13444** | **7103** | **-** | **0** | **0** |

**TABLE 16.1.B. Envelope Loads For Space "1059 LEARNING COMMONS" In Zone "VAV-1-16"**

| | | | | COOLING | COOLING | HEATING |
|---|---|---|---|---|---|---|
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 17.1.A. Component Loads For Space "1068 BREAKOUT" In Zone "VAV-1-17" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 208 ft² | 0 | - | 208 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 146 W | 450 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 104 W | 340 | - | 0 | 0 | - |
| People | 8 | 1718 | 1640 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 125 | 82 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **2633** | **1722** | **-** | **0** | **0** |

| TABLE 17.1.B. Envelope Loads For Space "1068 BREAKOUT" In Zone "VAV-1-17" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 18.1.A. Component Loads For Space "2210 SCIENCE CLASSROOM" In Zone "VAV-1-18" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 155 ft² | 4754 | - | 155 ft² | - | - |
| Wall Transmission | 466 ft² | 845 | - | 466 ft² | 1786 | - |
| Roof Transmission | 386 ft² | 378 | - | 386 ft² | 638 | - |
| Window Transmission | 155 ft² | 740 | - | 155 ft² | 3622 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 874 W | 2613 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 624 W | 2012 | - | 0 | 0 | - |
| People | 26 | 5338 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 388 | 426 | - | 1648 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 853 | 288 | 5% | 385 | 0 |
| **>> Total Zone Loads** | **-** | **17922** | **6044** | **-** | **8079** | **0** |

| TABLE 18.1.B. Envelope Loads For Space "2210 SCIENCE CLASSROOM" In Zone "VAV-1-18" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **W EXPOSURE** | | | | | | |
| WALL | 466 | 0.062 | - | 845 | - | 1786 |
| WINDOW 1 | 155 | 0.380 | 0.333 | 740 | 4754 | 3622 |
| **H EXPOSURE** | | | | | | |
| ROOF | 386 | 0.027 | - | 378 | - | 638 |

| TABLE 19.1.A. Component Loads For Space "2211A SCIENCE-PREP" In Zone "VAV-1-19" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 57 W | 175 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 41 W | 132 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 37 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **774** | **431** | **-** | **0** | **0** |

| TABLE 19.1.B. Envelope Loads For Space "2211A SCIENCE-PREP" In Zone "VAV-1-19" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 19.2.A. Component Loads For Space "2211B SCIENCE-PREP" In Zone "VAV-1-19" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 56 W | 173 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 40 W | 131 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 37 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **770** | **431** | **-** | **0** | **0** |

| TABLE 19.2.B. Envelope Loads For Space "2211B SCIENCE-PREP" In Zone "VAV-1-19" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 20.1.A. Component Loads For Space "2212 SCIENCE-TP" In Zone "VAV-1-20" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 49 W | 160 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 40 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **842** | **431** | **-** | **0** | **0** |

| TABLE 20.1.B. Envelope Loads For Space "2212 SCIENCE-TP" In Zone "VAV-1-20" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 21.1.A. Component Loads For Space "2214 SCIENCE CLASSROOM" In Zone "VAV-1-21" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 155 ft² | 2928 | - | 155 ft² | - | - |
| Wall Transmission | 55 ft² | 77 | - | 55 ft² | 211 | - |
| Roof Transmission | 377 ft² | 455 | - | 377 ft² | 623 | - |
| Window Transmission | 155 ft² | 781 | - | 155 ft² | 3622 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 873 W | 2558 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 624 W | 1993 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 145 | 136 | - | 557 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 706 | 273 | 5% | 251 | 0 |
| **>> Total Zone Loads** | **-** | **14830** | **5740** | **-** | **5264** | **0** |

| TABLE 21.1.B. Envelope Loads For Space "2214 SCIENCE CLASSROOM" In Zone "VAV-1-21" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **E EXPOSURE** | | | | | | |
| WALL | 55 | 0.062 | - | 77 | - | 211 |
| WINDOW 1 | 155 | 0.380 | 0.333 | 781 | 2928 | 3622 |
| **H EXPOSURE** | | | | | | |
| ROOF | 377 | 0.027 | - | 455 | - | 623 |

**TABLE 22.1.A. Component Loads For Space "2222 CLASSROOM-TP" In Zone "VAV-1-22"**

| | DESIGN COOLING | | | DESIGN HEATING | | |
|---|---|---|---|---|---|---|
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 90 ft² | 0 | - | 90 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 67 W | 208 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 48 W | 157 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 40 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **834** | **431** | **-** | **0** | **0** |

**TABLE 22.1.B. Envelope Loads For Space "2222 CLASSROOM-TP" In Zone "VAV-1-22"**

| | | | | COOLING | COOLING | HEATING |
|---|---|---|---|---|---|---|
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 23.1.A. Component Loads For Space "2224 CLASSROOM" In Zone "VAV-1-23" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 175 ft² | 2212 | - | 175 ft² | - | - |
| Wall Transmission | 282 ft² | 329 | - | 282 ft² | 1081 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 175 ft² | 873 | - | 175 ft² | 4090 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 610 W | 1806 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 436 W | 1398 | - | 0 | 0 | - |
| People | 26 | 5265 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 306 | 310 | - | 1213 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 610 | 282 | 5% | 319 | 0 |
| **>> Total Zone Loads** | **-** | **12800** | **5922** | **-** | **6703** | **0** |

| TABLE 23.1.B. Envelope Loads For Space "2224 CLASSROOM" In Zone "VAV-1-23" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NNE EXPOSURE** | | | | | | |
| WALL | 157 | 0.062 | - | 160 | - | 602 |
| WINDOW 1 | 175 | 0.380 | 0.437 | 873 | 2212 | 4090 |
| **E EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 76 | - | 215 |
| **WNW EXPOSURE** | | | | | | |
| WALL | 69 | 0.062 | - | 93 | - | 264 |

| TABLE 24.1.A. Component Loads For Space "2060A CORRIDOR (W)" In Zone "VAV-1-24" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1400<br>COOLING OA DB / WB 86.0 °F / 70.4 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 115 ft² | 3596 | - | 115 ft² | - | - |
| Wall Transmission | 185 ft² | 291 | - | 185 ft² | 709 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 115 ft² | 361 | - | 115 ft² | 2688 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1018 W | 2948 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 143 | 144 | - | 796 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 367 | 7 | 5% | 210 | 0 |
| **>> Total Zone Loads** | **-** | **7705** | **151** | **-** | **4402** | **0** |

| TABLE 24.1.B. Envelope Loads For Space "2060A CORRIDOR (W)" In Zone "VAV-1-24" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 185 | 0.062 | - | 291 | - | 709 |
| WINDOW 1 | 115 | 0.380 | 0.333 | 361 | 3596 | 2688 |

| TABLE 25.1.A. Component Loads For Space "2230 CLASSROOM-ELL" In Zone "VAV-1-25" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jun 1700<br>COOLING OA DB / WB 86.5 °F / 70.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 2486 | - | 190 ft² | - | - |
| Wall Transmission | 238 ft² | 221 | - | 238 ft² | 912 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 190 ft² | 690 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 610 W | 1826 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 436 W | 1406 | - | 0 | 0 | - |
| People | 26 | 5338 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 212 | 216 | - | 1136 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 609 | 277 | 5% | 324 | 0 |
| **>> Total Zone Loads** | **-** | **12788** | **5823** | **-** | **6813** | **0** |

| TABLE 25.1.B. Envelope Loads For Space "2230 CLASSROOM-ELL" In Zone "VAV-1-25" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **N EXPOSURE** | | | | | | |
| WALL | 161 | 0.062 | - | 137 | - | 617 |
| WINDOW 1 | 190 | 0.380 | 0.437 | 690 | 2486 | 4440 |
| **ENE EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 61 | - | 215 |
| **E EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 24 | - | 80 |

| TABLE 26.1.A. Component Loads For Space "2232 CLASSROOM-TP" In Zone "VAV-1-26" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 90 ft² | 0 | - | 90 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 49 W | 160 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 40 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **842** | **431** | **-** | **0** | **0** |

| TABLE 26.1.B. Envelope Loads For Space "2232 CLASSROOM-TP" In Zone "VAV-1-26" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 27.1.A. Component Loads For Space "2234 CLASSROOM" In Zone "VAV-1-27" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 2514 | - | 190 ft² | - | - |
| Wall Transmission | 267 ft² | 289 | - | 267 ft² | 1023 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 190 ft² | 957 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 613 W | 1797 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 438 W | 1400 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 316 | 309 | - | 1213 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 623 | 282 | 5% | 334 | 0 |
| **>> Total Zone Loads** | **-** | **13084** | **5921** | **-** | **7010** | **0** |

| TABLE 27.1.B. Envelope Loads For Space "2234 CLASSROOM" In Zone "VAV-1-27" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NNE EXPOSURE** | | | | | | |
| WALL | 142 | 0.062 | - | 137 | - | 544 |
| WINDOW 1 | 190 | 0.380 | 0.437 | 957 | 2514 | 4440 |
| **E EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 78 | - | 215 |
| **WNW EXPOSURE** | | | | | | |
| WALL | 69 | 0.062 | - | 75 | - | 264 |

| TABLE 28.1.A. Component Loads For Space "2059 COHORT COMMON" In Zone "VAV-1-28" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 800 W | 2474 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 572 W | 1868 | - | 0 | 0 | - |
| People | 30 | 6442 | 6150 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 539 | 308 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **11323** | **6458** | **-** | **0** | **0** |

| TABLE 28.1.B. Envelope Loads For Space "2059 COHORT COMMON" In Zone "VAV-1-28" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 29.1.A. Component Loads For Space "2056 BREAKOUT" In Zone "VAV-1-29" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 137 W | 422 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 98 W | 319 | - | 0 | 0 | - |
| People | 13 | 2792 | 2665 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 177 | 133 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **3709** | **2798** | **-** | **0** | **0** |

| TABLE 29.1.B. Envelope Loads For Space "2056 BREAKOUT" In Zone "VAV-1-29" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 30.1.A. Component Loads For Space "3210 CLASSROOM" In Zone "VAV-1-30" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 185 ft² | 3661 | - | 185 ft² | - | - |
| Wall Transmission | 635 ft² | 963 | - | 635 ft² | 2434 | - |
| Roof Transmission | 880 ft² | 862 | - | 880 ft² | 1455 | - |
| Window Transmission | 185 ft² | 883 | - | 185 ft² | 4323 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 616 W | 1843 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 440 W | 1419 | - | 0 | 0 | - |
| People | 26 | 5338 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 512 | 564 | - | 2176 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 774 | 295 | 5% | 519 | 0 |
| **>> Total Zone Loads** | **-** | **16253** | **6189** | **-** | **10907** | **0** |

| TABLE 30.1.B. Envelope Loads For Space "3210 CLASSROOM" In Zone "VAV-1-30" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NNW EXPOSURE** | | | | | | |
| WALL | 201 | 0.062 | - | 227 | - | 770 |
| WINDOW 1 | 185 | 0.380 | 0.437 | 883 | 3661 | 4323 |
| **NE EXPOSURE** | | | | | | |
| WALL | 63 | 0.062 | - | 73 | - | 241 |
| **W EXPOSURE** | | | | | | |
| WALL | 350 | 0.062 | - | 635 | - | 1341 |
| **E EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 28 | - | 80 |
| **H EXPOSURE** | | | | | | |
| ROOF | 880 | 0.027 | - | 862 | - | 1455 |

| TABLE 31.1.A. Component Loads For Space "3212 CLASSROOM-TP" In Zone "VAV-1-31" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 96 ft² | 107 | - | 96 ft² | 159 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 67 W | 199 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 48 W | 154 | - | 0 | 0 | - |
| People | 2 | 405 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 43 | 21 | 5% | 8 | 0 |
| **>> Total Zone Loads** | **-** | **909** | **431** | **-** | **167** | **0** |

| TABLE 31.1.B. Envelope Loads For Space "3212 CLASSROOM-TP" In Zone "VAV-1-31" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 96 | 0.027 | - | 107 | - | 159 |

| TABLE 32.1.A. Component Loads For Space "3214 CLASSROOM" In Zone "VAV-1-32" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 185 ft² | 2115 | - | 185 ft² | - | - |
| Wall Transmission | 340 ft² | 402 | - | 340 ft² | 1303 | - |
| Roof Transmission | 868 ft² | 850 | - | 868 ft² | 1435 | - |
| Window Transmission | 185 ft² | 883 | - | 185 ft² | 4323 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 608 W | 1818 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 434 W | 1399 | - | 0 | 0 | - |
| People | 26 | 5338 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 328 | 360 | - | 1393 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 657 | 284 | 5% | 423 | 0 |
| **>> Total Zone Loads** | **-** | **13788** | **5974** | **-** | **8877** | **0** |

| TABLE 32.1.B. Envelope Loads For Space "3214 CLASSROOM" In Zone "VAV-1-32" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **N EXPOSURE** | | | | | | |
| WALL | 207 | 0.062 | - | 209 | - | 793 |
| WINDOW 1 | 185 | 0.380 | 0.437 | 883 | 2115 | 4323 |
| **ENE EXPOSURE** | | | | | | |
| WALL | 63 | 0.062 | - | 79 | - | 241 |
| **WNW EXPOSURE** | | | | | | |
| WALL | 70 | 0.062 | - | 114 | - | 268 |
| **H EXPOSURE** | | | | | | |
| ROOF | 868 | 0.027 | - | 850 | - | 1435 |

| TABLE 33.1.A. Component Loads For Space "3220 CLASSROOM" In Zone "VAV-1-33" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 144 ft² | 1646 | - | 144 ft² | - | - |
| Wall Transmission | 360 ft² | 402 | - | 360 ft² | 1380 | - |
| Roof Transmission | 869 ft² | 851 | - | 869 ft² | 1437 | - |
| Window Transmission | 144 ft² | 687 | - | 144 ft² | 3365 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 608 W | 1820 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 435 W | 1401 | - | 0 | 0 | - |
| People | 26 | 5338 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 315 | 345 | - | 1338 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 623 | 284 | 5% | 376 | 0 |
| **>> Total Zone Loads** | **-** | **13082** | **5959** | **-** | **7895** | **0** |

| TABLE 33.1.B. Envelope Loads For Space "3220 CLASSROOM" In Zone "VAV-1-33" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **N EXPOSURE** | | | | | | |
| WALL | 248 | 0.062 | - | 250 | - | 950 |
| WINDOW 1 | 144 | 0.380 | 0.437 | 687 | 1646 | 3365 |
| **NE EXPOSURE** | | | | | | |
| WALL | 63 | 0.062 | - | 73 | - | 241 |
| **W EXPOSURE** | | | | | | |
| WALL | 28 | 0.062 | - | 51 | - | 107 |
| **E EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 28 | - | 80 |
| **H EXPOSURE** | | | | | | |
| ROOF | 869 | 0.027 | - | 851 | - | 1437 |

| TABLE 34.1.A. Component Loads For Space "3222 CLASSROOM-TP" In Zone "VAV-1-34" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 98 ft² | 110 | - | 98 ft² | 162 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 203 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 49 W | 157 | - | 0 | 0 | - |
| People | 2 | 405 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 44 | 21 | 5% | 8 | 0 |
| **>> Total Zone Loads** | **-** | **919** | **431** | **-** | **170** | **0** |

| TABLE 34.1.B. Envelope Loads For Space "3222 CLASSROOM-TP" In Zone "VAV-1-34" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 98 | 0.027 | - | 110 | - | 162 |

| TABLE 35.1.A. Component Loads For Space "3060A CORRIDOR (W)" In Zone "VAV-1-35" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 400 ft² | 19690 | - | 400 ft² | - | - |
| Wall Transmission | 439 ft² | 581 | - | 439 ft² | 1682 | - |
| Roof Transmission | 1155 ft² | 1427 | - | 1155 ft² | 1909 | - |
| Window Transmission | 107 ft² | 519 | - | 107 ft² | 2501 | - |
| Skylight Transmission | 293 ft² | 898 | - | 293 ft² | 4325 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1014 W | 2936 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 366 | 372 | - | 1449 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 1321 | 19 | 5% | 593 | 0 |
| **>> Total Zone Loads** | **-** | **27737** | **391** | **-** | **12459** | **0** |

| TABLE 35.1.B. Envelope Loads For Space "3060A CORRIDOR (W)" In Zone "VAV-1-35" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 439 | 0.062 | - | 581 | - | 1682 |
| WINDOW 1 | 107 | 0.380 | 0.333 | 519 | 1819 | 2501 |
| **H EXPOSURE** | | | | | | |
| ROOF | 1155 | 0.027 | - | 1427 | - | 1909 |
| SKYLIGHT | 293 | 0.240 | 0.448 | 898 | 17872 | 4325 |

| TABLE 36.1.A. Component Loads For Space "3224 CLASSROOM" In Zone "VAV-1-36" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 185 ft² | 2448 | - | 185 ft² | - | - |
| Wall Transmission | 312 ft² | 334 | - | 312 ft² | 1196 | - |
| Roof Transmission | 874 ft² | 1054 | - | 874 ft² | 1445 | - |
| Window Transmission | 185 ft² | 932 | - | 185 ft² | 4323 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 612 W | 1793 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 437 W | 1397 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 343 | 338 | - | 1319 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 674 | 283 | 5% | 414 | 0 |
| **>> Total Zone Loads** | **-** | **14164** | **5952** | **-** | **8697** | **0** |

| TABLE 36.1.B. Envelope Loads For Space "3224 CLASSROOM" In Zone "VAV-1-36" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NNE EXPOSURE** | | | | | | |
| WALL | 207 | 0.062 | - | 200 | - | 793 |
| WINDOW 1 | 185 | 0.380 | 0.437 | 932 | 2448 | 4323 |
| **ENE EXPOSURE** | | | | | | |
| WALL | 63 | 0.062 | - | 80 | - | 241 |
| **E EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 29 | - | 80 |
| **W EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 26 | - | 80 |
| **H EXPOSURE** | | | | | | |
| ROOF | 874 | 0.027 | - | 1054 | - | 1445 |

| TABLE 37.1.A. Component Loads For Space "3230 CLASSROOM" In Zone "VAV-1-37" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 185 ft² | 2115 | - | 185 ft² | - | - |
| Wall Transmission | 312 ft² | 348 | - | 312 ft² | 1196 | - |
| Roof Transmission | 876 ft² | 858 | - | 876 ft² | 1448 | - |
| Window Transmission | 185 ft² | 883 | - | 185 ft² | 4323 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 613 W | 1834 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 438 W | 1412 | - | 0 | 0 | - |
| People | 26 | 5338 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 310 | 341 | - | 1319 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 655 | 284 | 5% | 414 | 0 |
| **>> Total Zone Loads** | **-** | **13752** | **5954** | **-** | **8701** | **0** |

| TABLE 37.1.B. Envelope Loads For Space "3230 CLASSROOM" In Zone "VAV-1-37" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **N EXPOSURE** | | | | | | |
| WALL | 207 | 0.062 | - | 209 | - | 793 |
| WINDOW 1 | 185 | 0.380 | 0.437 | 883 | 2115 | 4323 |
| **NE EXPOSURE** | | | | | | |
| WALL | 63 | 0.062 | - | 73 | - | 241 |
| **W EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 38 | - | 80 |
| **E EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 28 | - | 80 |
| **H EXPOSURE** | | | | | | |
| ROOF | 876 | 0.027 | - | 858 | - | 1448 |

| TABLE 38.1.A. Component Loads For Space "3232 CLASSROOM-TP" In Zone "VAV-1-38" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 94 ft² | 105 | - | 94 ft² | 155 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 66 W | 195 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 47 W | 151 | - | 0 | 0 | - |
| People | 2 | 405 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 43 | 21 | 5% | 8 | 0 |
| **>> Total Zone Loads** | **-** | **899** | **431** | **-** | **163** | **0** |

| TABLE 38.1.B. Envelope Loads For Space "3232 CLASSROOM-TP" In Zone "VAV-1-38" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 94 | 0.027 | - | 105 | - | 155 |

| TABLE 39.1.A. Component Loads For Space "3234 CLASSROOM" In Zone "VAV-1-39" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 185 ft² | 2448 | - | 185 ft² | - | - |
| Wall Transmission | 340 ft² | 355 | - | 340 ft² | 1303 | - |
| Roof Transmission | 872 ft² | 1052 | - | 872 ft² | 1442 | - |
| Window Transmission | 185 ft² | 932 | - | 185 ft² | 4323 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 610 W | 1789 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 436 W | 1394 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 362 | 358 | - | 1393 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 676 | 284 | 5% | 423 | 0 |
| **>> Total Zone Loads** | **-** | **14195** | **5972** | **-** | **8884** | **0** |

| TABLE 39.1.B. Envelope Loads For Space "3234 CLASSROOM" In Zone "VAV-1-39" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NNE EXPOSURE** | | | | | | |
| WALL | 207 | 0.062 | - | 200 | - | 793 |
| WINDOW 1 | 185 | 0.380 | 0.437 | 932 | 2448 | 4323 |
| **ENE EXPOSURE** | | | | | | |
| WALL | 63 | 0.062 | - | 80 | - | 241 |
| **WNW EXPOSURE** | | | | | | |
| WALL | 70 | 0.062 | - | 76 | - | 268 |
| **H EXPOSURE** | | | | | | |
| ROOF | 872 | 0.027 | - | 1052 | - | 1442 |

| TABLE 40.1.A. Component Loads For Space "3068 BREAKOUT" In Zone "VAV-1-40" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jun 1400<br>COOLING OA DB / WB 87.5 °F / 70.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 216 ft² | 11930 | - | 216 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 20 ft² | 24 | - | 20 ft² | 33 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 216 ft² | 506 | - | 216 ft² | 3188 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 156 W | 452 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 112 W | 355 | - | 0 | 0 | - |
| People | 8 | 1571 | 1640 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 742 | 82 | 5% | 161 | 0 |
| **>> Total Zone Loads** | **-** | **15579** | **1722** | **-** | **3382** | **0** |

| TABLE 40.1.B. Envelope Loads For Space "3068 BREAKOUT" In Zone "VAV-1-40" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 20 | 0.027 | - | 24 | - | 33 |
| **W EXPOSURE** | | | | | | |
| SKYLIGHT | 123 | 0.240 | 0.448 | 288 | 7269 | 1815 |
| **E EXPOSURE** | | | | | | |
| SKYLIGHT | 93 | 0.240 | 0.448 | 218 | 4661 | 1373 |

| TABLE 41.1.A. Component Loads For Space "1166 STAFF LUNCH" In Zone "VAV-1-41" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 113 ft² | 3323 | - | 113 ft² | - | - |
| Wall Transmission | 384 ft² | 491 | - | 384 ft² | 1472 | - |
| Roof Transmission | 30 ft² | 31 | - | 30 ft² | 50 | - |
| Window Transmission | 113 ft² | 564 | - | 113 ft² | 2641 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 370 ft² | 0 | - | 370 ft² | 606 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 259 W | 767 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 93 W | 297 | - | 0 | 0 | - |
| People | 12 | 2430 | 2460 | 0 | 0 | 0 |
| Infiltration | - | 333 | 341 | - | 1319 | 0 |
| Miscellaneous | - | 400 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 432 | 140 | 5% | 304 | 0 |
| **>> Total Zone Loads** | **-** | **9067** | **2941** | **-** | **6391** | **0** |

| TABLE 41.1.B. Envelope Loads For Space "1166 STAFF LUNCH" In Zone "VAV-1-41" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 266 | 0.062 | - | 281 | - | 1019 |
| **SW EXPOSURE** | | | | | | |
| WALL | 62 | 0.062 | - | 111 | - | 238 |
| WINDOW 1 | 113 | 0.380 | 0.333 | 564 | 3323 | 2641 |
| **S EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 98 | - | 215 |
| **H EXPOSURE** | | | | | | |
| ROOF | 30 | 0.027 | - | 31 | - | 50 |

| TABLE 42.1.A. Component Loads For Space "1160 TECH/FAB LAB" In Zone "VAV-1-42" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 236 ft² | 7816 | - | 236 ft² | - | - |
| Wall Transmission | 475 ft² | 556 | - | 475 ft² | 1820 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 236 ft² | 786 | - | 236 ft² | 5515 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1202 ft² | 0 | - | 1202 ft² | 1324 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 841 W | 2465 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 601 W | 1921 | - | 0 | 0 | - |
| People | 20 | 3990 | 4100 | 0 | 0 | 0 |
| Infiltration | - | 353 | 355 | - | 1887 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 894 | 223 | 5% | 527 | 0 |
| **>> Total Zone Loads** | **-** | **18782** | **4677** | **-** | **11074** | **0** |

| TABLE 42.1.B. Envelope Loads For Space "1160 TECH/FAB LAB" In Zone "VAV-1-42" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 133 | 0.062 | - | 68 | - | 510 |
| **SW EXPOSURE** | | | | | | |
| WALL | 209 | 0.062 | - | 299 | - | 801 |
| WINDOW 1 | 236 | 0.380 | 0.333 | 786 | 7816 | 5515 |
| **SE EXPOSURE** | | | | | | |
| WALL | 133 | 0.062 | - | 189 | - | 510 |

| TABLE 43.1.A. Component Loads For Space "1000A CORRIDOR (W)" In Zone "VAV-1-43" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1805 ft² | 0 | - | 1805 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1315 W | 4066 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 203 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **4270** | **0** | **-** | **0** | **0** |

| TABLE 43.1.B. Envelope Loads For Space "1000A CORRIDOR (W)" In Zone "VAV-1-43" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 43.2.A. Component Loads For Space "1150 TOILET (4 STALL)" In Zone "VAV-1-43" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 31 ft² | 912 | - | 31 ft² | - | - |
| Wall Transmission | 117 ft² | 210 | - | 117 ft² | 448 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 31 ft² | 155 | - | 31 ft² | 724 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 240 ft² | 0 | - | 240 ft² | 268 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 168 W | 498 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 99 | 121 | - | 393 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 94 | 6 | 5% | 92 | 0 |
| **>> Total Zone Loads** | **-** | **1967** | **127** | **-** | **1926** | **0** |

| TABLE 43.2.B. Envelope Loads For Space "1150 TOILET (4 STALL)" In Zone "VAV-1-43" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SW EXPOSURE** | | | | | | |
| WALL | 117 | 0.062 | - | 210 | - | 448 |
| WINDOW 1 | 31 | 0.380 | 0.333 | 155 | 912 | 724 |

| TABLE 43.3.A. Component Loads For Space "1152 TOILET (1 STALL)" In Zone "VAV-1-43" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 54 ft² | 0 | - | 54 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 38 W | 117 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 6 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **123** | **0** | **-** | **0** | **0** |

| TABLE 43.3.B. Envelope Loads For Space "1152 TOILET (1 STALL)" In Zone "VAV-1-43" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 43.4.A. Component Loads For Space "1153 STOREROOM" In Zone "VAV-1-43" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1800<br>COOLING OA DB / WB 87.8 °F / 72.1 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 84 ft² | 172 | - | 84 ft² | 322 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 150 ft² | 0 | - | 150 ft² | 160 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 105 W | 317 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 46 | 69 | - | 223 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 27 | 3 | 5% | 35 | 0 |
| **>> Total Zone Loads** | **-** | **562** | **73** | **-** | **740** | **0** |

| TABLE 43.4.B. Envelope Loads For Space "1153 STOREROOM" In Zone "VAV-1-43" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SW EXPOSURE** | | | | | | |
| WALL | 84 | 0.062 | - | 172 | - | 322 |

| TABLE 43.5.A. Component Loads For Space "1154 TOILET (1 STALL)" In Zone "VAV-1-43" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 54 ft² | 0 | - | 54 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 38 W | 117 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 6 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **123** | **0** | **-** | **0** | **0** |

| TABLE 43.5.B. Envelope Loads For Space "1154 TOILET (1 STALL)" In Zone "VAV-1-43" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 43.6.A. Component Loads For Space "1156 TOILET (4 STALL)" In Zone "VAV-1-43" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 31 ft² | 912 | - | 31 ft² | - | - |
| Wall Transmission | 109 ft² | 196 | - | 109 ft² | 418 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 31 ft² | 155 | - | 31 ft² | 724 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 229 ft² | 0 | - | 229 ft² | 256 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 160 W | 475 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 94 | 115 | - | 372 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 92 | 6 | 5% | 88 | 0 |
| **>> Total Zone Loads** | **-** | **1922** | **120** | **-** | **1858** | **0** |

| TABLE 43.6.B. Envelope Loads For Space "1156 TOILET (4 STALL)" In Zone "VAV-1-43" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SW EXPOSURE** | | | | | | |
| WALL | 109 | 0.062 | - | 196 | - | 418 |
| WINDOW 1 | 31 | 0.380 | 0.333 | 155 | 912 | 724 |

| TABLE 44.1.A. Component Loads For Space "1055A CAF/LEARN COMM" In Zone "VAV-1-44" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jun 1400<br>COOLING OA DB / WB 87.5 °F / 70.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 1054 ft² | 66795 | - | 1054 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 1284 ft² | 1518 | - | 1284 ft² | 2123 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 1054 ft² | 2470 | - | 1054 ft² | 15557 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 2338 ft² | 0 | - | 2338 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1637 W | 4740 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 585 W | 1860 | - | 0 | 0 | - |
| People | 216 | 39808 | 25920 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 5860 | 1296 | 5% | 884 | 0 |
| **>> Total Zone Loads** | **-** | **123051** | **27216** | **-** | **18564** | **0** |

| TABLE 44.1.B. Envelope Loads For Space "1055A CAF/LEARN COMM" In Zone "VAV-1-44" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 1284 | 0.027 | - | 1518 | - | 2123 |
| SKYLIGHT | 1054 | 0.240 | 0.448 | 2470 | 66795 | 15557 |

| TABLE 45.1.A. Component Loads For Space "1008 CORRIDOR" In Zone "VAV-1-45" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1900<br>COOLING OA DB / WB 85.8 °F / 71.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 273 ft² | 457 | - | 273 ft² | 1046 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 334 ft² | 0 | - | 334 ft² | 430 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 234 W | 712 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 127 | 190 | - | 725 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 65 | 10 | 5% | 110 | 0 |
| **>> Total Zone Loads** | **-** | **1361** | **200** | **-** | **2311** | **0** |

| TABLE 45.1.B. Envelope Loads For Space "1008 CORRIDOR" In Zone "VAV-1-45" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 273 | 0.062 | - | 457 | - | 1046 |

| TABLE 45.2.A. Component Loads For Space "1010 RECEIVING" In Zone "VAV-1-45" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1900<br>COOLING OA DB / WB 85.8 °F / 71.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 207 ft² | 347 | - | 207 ft² | 793 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 312 ft² | 0 | - | 312 ft² | 363 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 218 W | 665 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 2 | 507 | 910 | 0 | 0 | 0 |
| Infiltration | - | 96 | 144 | - | 549 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 81 | 53 | 5% | 85 | 0 |
| **>> Total Zone Loads** | **-** | **1696** | **1107** | **-** | **1791** | **0** |

| TABLE 45.2.B. Envelope Loads For Space "1010 RECEIVING" In Zone "VAV-1-45" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 207 | 0.062 | - | 347 | - | 793 |

| TABLE 45.3.A. Component Loads For Space "1011 CUSTODIAN WORKSHOP" In Zone "VAV-1-45" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 251 ft² | 0 | - | 251 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 176 W | 543 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 300 W | 981 | - | 0 | 0 | - |
| People | 2 | 517 | 910 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 102 | 46 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **2143** | **956** | **-** | **0** | **0** |

| TABLE 45.3.B. Envelope Loads For Space "1011 CUSTODIAN WORKSHOP" In Zone "VAV-1-45" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 45.4.A. Component Loads For Space "1011A CUSTODIAL STORAGE" In Zone "VAV-1-45" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 45 ft² | 0 | - | 45 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 32 W | 97 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 5 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **102** | **0** | **-** | **0** | **0** |

| TABLE 45.4.B. Envelope Loads For Space "1011A CUSTODIAL STORAGE" In Zone "VAV-1-45" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 45.5.A. Component Loads For Space "1020 CORRIDOR" In Zone "VAV-1-45" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 91 ft² | 138 | - | 91 ft² | 349 | - |
| Roof Transmission | 250 ft² | 309 | - | 250 ft² | 413 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 219 ft² | 0 | - | 219 ft² | 199 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 153 W | 444 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 61 | 64 | - | 242 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 48 | 3 | 5% | 60 | 0 |
| **>> Total Zone Loads** | **-** | **1000** | **67** | **-** | **1263** | **0** |

| TABLE 45.5.B. Envelope Loads For Space "1020 CORRIDOR" In Zone "VAV-1-45" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **ESE EXPOSURE** | | | | | | |
| WALL | 91 | 0.062 | - | 138 | - | 349 |
| **H EXPOSURE** | | | | | | |
| ROOF | 250 | 0.027 | - | 309 | - | 413 |

| TABLE 46.1.A. Component Loads For Space "1027 CUST OFFICE/BREAK" In Zone "VAV-1-46" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 30 ft² | 675 | - | 30 ft² | - | - |
| Wall Transmission | 509 ft² | 804 | - | 509 ft² | 1951 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 30 ft² | 143 | - | 30 ft² | 701 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 328 ft² | 0 | - | 328 ft² | 561 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 230 W | 687 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 492 W | 1586 | - | 0 | 0 | - |
| People | 9 | 1848 | 1845 | 0 | 0 | 0 |
| Infiltration | - | 337 | 370 | - | 1430 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 304 | 111 | 5% | 232 | 0 |
| **>> Total Zone Loads** | **-** | **6384** | **2326** | **-** | **4875** | **0** |

| TABLE 46.1.B. Envelope Loads For Space "1027 CUST OFFICE/BREAK" In Zone "VAV-1-46" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 194 | 0.062 | - | 269 | - | 744 |
| WINDOW 1 | 30 | 0.380 | 0.333 | 143 | 675 | 701 |
| **SSW EXPOSURE** | | | | | | |
| WALL | 315 | 0.062 | - | 535 | - | 1207 |

**TABLE 47.1.A. Component Loads For Space "1141 KITCHEN OFFICE" In Zone "VAV-1-47"**

| | DESIGN COOLING | | | DESIGN HEATING | | |
|---|---|---|---|---|---|---|
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 75 ft² | 0 | - | 75 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 53 W | 162 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 113 W | 368 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 48 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1008** | **431** | **-** | **0** | **0** |

**TABLE 47.1.B. Envelope Loads For Space "1141 KITCHEN OFFICE" In Zone "VAV-1-47"**

| | | | | COOLING | COOLING | HEATING |
|---|---|---|---|---|---|---|
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 48.1.A. Component Loads For Space "2168B SPED-READING" In Zone "VAV-1-48" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1900<br>COOLING OA DB / WB 85.8 °F / 71.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 182 ft² | 305 | - | 182 ft² | 698 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 141 W | 428 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 101 W | 326 | - | 0 | 0 | - |
| People | 4 | 790 | 480 | 0 | 0 | 0 |
| Infiltration | - | 85 | 124 | - | 483 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 97 | 30 | 5% | 59 | 0 |
| **>> Total Zone Loads** | **-** | **2031** | **634** | **-** | **1240** | **0** |

| TABLE 48.1.B. Envelope Loads For Space "2168B SPED-READING" In Zone "VAV-1-48" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 182 | 0.062 | - | 305 | - | 698 |

| TABLE 49.1.A. Component Loads For Space "2168A SPED-READING" In Zone "VAV-1-49" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 95 W | 292 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 68 W | 221 | - | 0 | 0 | - |
| People | 4 | 806 | 480 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 66 | 24 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1385** | **504** | **-** | **0** | **0** |

| TABLE 49.1.B. Envelope Loads For Space "2168A SPED-READING" In Zone "VAV-1-49" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 50.1.A. Component Loads For Space "2168C SPED-RESOURCE" In Zone "VAV-1-50" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 63 ft² | 1853 | - | 63 ft² | - | - |
| Wall Transmission | 586 ft² | 894 | - | 586 ft² | 2246 | - |
| Roof Transmission | 16 ft² | 17 | - | 16 ft² | 27 | - |
| Window Transmission | 63 ft² | 314 | - | 63 ft² | 1472 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 351 W | 1041 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 251 W | 806 | - | 0 | 0 | - |
| People | 16 | 3240 | 3280 | 0 | 0 | 0 |
| Infiltration | - | 435 | 445 | - | 1722 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 430 | 186 | 5% | 273 | 0 |
| **>> Total Zone Loads** | **-** | **9030** | **3911** | **-** | **5741** | **0** |

| TABLE 50.1.B. Envelope Loads For Space "2168C SPED-RESOURCE" In Zone "VAV-1-50" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 215 | 0.062 | - | 228 | - | 824 |
| **SW EXPOSURE** | | | | | | |
| WALL | 371 | 0.062 | - | 667 | - | 1422 |
| WINDOW 1 | 63 | 0.380 | 0.333 | 314 | 1853 | 1472 |
| **H EXPOSURE** | | | | | | |
| ROOF | 16 | 0.027 | - | 17 | - | 27 |

| TABLE 51.1.A. Component Loads For Space "2166 GUIDANCE-OFFICE" In Zone "VAV-1-51" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 95 W | 292 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 203 W | 662 | - | 0 | 0 | - |
| People | 4 | 859 | 820 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 91 | 41 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1904** | **861** | **-** | **0** | **0** |

| TABLE 51.1.B. Envelope Loads For Space "2166 GUIDANCE-OFFICE" In Zone "VAV-1-51" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 52.1.A. Component Loads For Space "2165 GUIDANCE-OFFICE" In Zone "VAV-1-52" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 66 ft² | 2132 | - | 66 ft² | - | - |
| Wall Transmission | 195 ft² | 176 | - | 195 ft² | 747 | - |
| Roof Transmission | 135 ft² | 111 | - | 135 ft² | 223 | - |
| Window Transmission | 66 ft² | 220 | - | 66 ft² | 1542 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 107 W | 314 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 230 W | 734 | - | 0 | 0 | - |
| People | 2 | 399 | 410 | 0 | 0 | 0 |
| Infiltration | - | 130 | 130 | - | 693 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 211 | 27 | 5% | 160 | 0 |
| **>> Total Zone Loads** | **-** | **4425** | **568** | **-** | **3366** | **0** |

| TABLE 52.1.B. Envelope Loads For Space "2165 GUIDANCE-OFFICE" In Zone "VAV-1-52" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 127 | 0.062 | - | 65 | - | 487 |
| **SSW EXPOSURE** | | | | | | |
| WALL | 68 | 0.062 | - | 111 | - | 261 |
| WINDOW 1 | 66 | 0.380 | 0.333 | 220 | 2132 | 1542 |
| **H EXPOSURE** | | | | | | |
| ROOF | 135 | 0.027 | - | 111 | - | 223 |

| TABLE 53.1.A. Component Loads For Space "2164 OFFICE-DEPT" In Zone "VAV-1-53" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 90 ft² | 2981 | - | 90 ft² | - | - |
| Wall Transmission | 40 ft² | 57 | - | 40 ft² | 153 | - |
| Roof Transmission | 135 ft² | 111 | - | 135 ft² | 223 | - |
| Window Transmission | 90 ft² | 300 | - | 90 ft² | 2103 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 111 W | 326 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 239 W | 763 | - | 0 | 0 | - |
| People | 2 | 399 | 410 | 0 | 0 | 0 |
| Infiltration | - | 65 | 65 | - | 345 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 250 | 24 | 5% | 141 | 0 |
| **>> Total Zone Loads** | **-** | **5250** | **499** | **-** | **2966** | **0** |

| TABLE 53.1.B. Envelope Loads For Space "2164 OFFICE-DEPT" In Zone "VAV-1-53" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SW EXPOSURE** | | | | | | |
| WALL | 40 | 0.062 | - | 57 | - | 153 |
| WINDOW 1 | 90 | 0.380 | 0.333 | 300 | 2981 | 2103 |
| **H EXPOSURE** | | | | | | |
| ROOF | 135 | 0.027 | - | 111 | - | 223 |

| TABLE 54.1.A. Component Loads For Space "2163 OFFICE-DEPT" In Zone "VAV-1-54" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 66 ft² | 2186 | - | 66 ft² | - | - |
| Wall Transmission | 185 ft² | 263 | - | 185 ft² | 709 | - |
| Roof Transmission | 81 ft² | 66 | - | 81 ft² | 133 | - |
| Window Transmission | 66 ft² | 220 | - | 66 ft² | 1542 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 111 W | 324 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 237 W | 758 | - | 0 | 0 | - |
| People | 2 | 399 | 410 | 0 | 0 | 0 |
| Infiltration | - | 125 | 126 | - | 666 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 217 | 27 | 5% | 153 | 0 |
| **>> Total Zone Loads** | **-** | **4557** | **562** | **-** | **3203** | **0** |

| TABLE 54.1.B. Envelope Loads For Space "2163 OFFICE-DEPT" In Zone "VAV-1-54" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SW EXPOSURE** | | | | | | |
| WALL | 61 | 0.062 | - | 87 | - | 234 |
| WINDOW 1 | 66 | 0.380 | 0.333 | 220 | 2186 | 1542 |
| **SE EXPOSURE** | | | | | | |
| WALL | 124 | 0.062 | - | 176 | - | 475 |
| **H EXPOSURE** | | | | | | |
| ROOF | 81 | 0.027 | - | 66 | - | 133 |

| TABLE 55.1.A. Component Loads For Space "2161 GUIDANCE-WAITING" In Zone "VAV-1-55" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 53 W | 164 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 4 | 859 | 820 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 51 | 41 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1075** | **861** | **-** | **0** | **0** |

| TABLE 55.1.B. Envelope Loads For Space "2161 GUIDANCE-WAITING" In Zone "VAV-1-55" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 55.2.A. Component Loads For Space "2161A GUIDANCE-STORAGE" In Zone "VAV-1-55" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 9 W | 28 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 1 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **30** | **0** | **-** | **0** | **0** |

| TABLE 55.2.B. Envelope Loads For Space "2161A GUIDANCE-STORAGE" In Zone "VAV-1-55" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 55.3.A. Component Loads For Space "2161B CORRIDOR" In Zone "VAV-1-55" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 158 W | 489 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 24 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **514** | **0** | **-** | **0** | **0** |

| TABLE 55.3.B. Envelope Loads For Space "2161B CORRIDOR" In Zone "VAV-1-55" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 56.1.A. Component Loads For Space "2160 WORKROOM" In Zone "VAV-1-56" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 133 W | 411 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 285 W | 932 | - | 0 | 0 | - |
| People | 8 | 1718 | 1640 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 153 | 82 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **3214** | **1722** | **-** | **0** | **0** |

| TABLE 56.1.B. Envelope Loads For Space "2160 WORKROOM" In Zone "VAV-1-56" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 57.1.A. Component Loads For Space "2000A CORRIDOR (W)" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 109 ft² | 3343 | - | 109 ft² | - | - |
| Wall Transmission | 80 ft² | 145 | - | 80 ft² | 307 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 109 ft² | 520 | - | 109 ft² | 2547 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1145 W | 3426 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 118 | 130 | - | 502 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 378 | 6 | 5% | 168 | 0 |
| **>> Total Zone Loads** | **-** | **7930** | **136** | **-** | **3523** | **0** |

| TABLE 57.1.B. Envelope Loads For Space "2000A CORRIDOR (W)" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **W EXPOSURE** | | | | | | |
| WALL | 80 | 0.062 | - | 145 | - | 307 |
| WINDOW 1 | 109 | 0.380 | 0.333 | 520 | 3343 | 2547 |

| TABLE 57.2.A. Component Loads For Space "2150 TOILET (4 STALLS)" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 32 ft² | 941 | - | 32 ft² | - | - |
| Wall Transmission | 108 ft² | 194 | - | 108 ft² | 414 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 32 ft² | 160 | - | 32 ft² | 748 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 164 W | 485 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 94 | 96 | - | 372 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 94 | 5 | 5% | 77 | 0 |
| **>> Total Zone Loads** | **-** | **1967** | **101** | **-** | **1610** | **0** |

| TABLE 57.2.B. Envelope Loads For Space "2150 TOILET (4 STALLS)" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SW EXPOSURE** | | | | | | |
| WALL | 108 | 0.062 | - | 194 | - | 414 |
| WINDOW 1 | 32 | 0.380 | 0.333 | 160 | 941 | 748 |

| TABLE 57.3.A. Component Loads For Space "2152 TOILET (1 STALL)" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 38 W | 117 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 6 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **123** | **0** | **-** | **0** | **0** |

| TABLE 57.3.B. Envelope Loads For Space "2152 TOILET (1 STALL)" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 57.4.A. Component Loads For Space "2153 STOREROOM" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 11 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **223** | **0** | **-** | **0** | **0** |

| TABLE 57.4.B. Envelope Loads For Space "2153 STOREROOM" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 57.5.A. Component Loads For Space "2154 TOILET (1 STALL)" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 38 W | 117 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 6 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **123** | **0** | **-** | **0** | **0** |

| TABLE 57.5.B. Envelope Loads For Space "2154 TOILET (1 STALL)" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 57.6.A. Component Loads For Space "2155 IDF" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1800<br>COOLING OA DB / WB 87.8 °F / 72.1 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 80 ft² | 163 | - | 80 ft² | 307 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 34 W | 104 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 1000 W | 3237 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 44 | 56 | - | 212 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 177 | 3 | 5% | 26 | 0 |
| **>> Total Zone Loads** | **-** | **3725** | **59** | **-** | **545** | **0** |

| TABLE 57.6.B. Envelope Loads For Space "2155 IDF" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SW EXPOSURE** | | | | | | |
| WALL | 80 | 0.062 | - | 163 | - | 307 |

| TABLE 57.7.A. Component Loads For Space "2156 TOILET (4 STALLS)" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 32 ft² | 1060 | - | 32 ft² | - | - |
| Wall Transmission | 98 ft² | 140 | - | 98 ft² | 376 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 32 ft² | 107 | - | 32 ft² | 748 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 151 W | 443 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 65 | 66 | - | 345 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 91 | 3 | 5% | 73 | 0 |
| **>> Total Zone Loads** | **-** | **1905** | **70** | **-** | **1542** | **0** |

| TABLE 57.7.B. Envelope Loads For Space "2156 TOILET (4 STALLS)" In Zone "VAV-1-57" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SW EXPOSURE** | | | | | | |
| WALL | 98 | 0.062 | - | 140 | - | 376 |
| WINDOW 1 | 32 | 0.380 | 0.333 | 107 | 1060 | 748 |

| TABLE 58.1.A. Component Loads For Space "2058 BREAKOUT" In Zone "VAV-1-58" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 242 W | 749 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 173 W | 566 | - | 0 | 0 | - |
| People | 6 | 1288 | 1230 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 130 | 62 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **2733** | **1292** | **-** | **0** | **0** |

| TABLE 58.1.B. Envelope Loads For Space "2058 BREAKOUT" In Zone "VAV-1-58" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 59.1.A. Component Loads For Space "2040 MEDICAL OFFICE" In Zone "VAV-1-59" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 109 W | 335 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 233 W | 760 | - | 0 | 0 | - |
| People | 4 | 859 | 820 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 98 | 41 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **2052** | **861** | **-** | **0** | **0** |

| TABLE 59.1.B. Envelope Loads For Space "2040 MEDICAL OFFICE" In Zone "VAV-1-59" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 59.2.A. Component Loads For Space "2046A EXAM" In Zone "VAV-1-59" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 72 W | 223 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 155 W | 505 | - | 0 | 0 | - |
| People | 1 | 202 | 120 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 46 | 6 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **976** | **126** | **-** | **0** | **0** |

| TABLE 59.2.B. Envelope Loads For Space "2046A EXAM" In Zone "VAV-1-59" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 59.3.A. Component Loads For Space "2046B EXAM" In Zone "VAV-1-59" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 70 W | 216 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 150 W | 490 | - | 0 | 0 | - |
| People | 1 | 202 | 120 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 45 | 6 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **954** | **126** | **-** | **0** | **0** |

| TABLE 59.3.B. Envelope Loads For Space "2046B EXAM" In Zone "VAV-1-59" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 59.4.A. Component Loads For Space "2046C EXAM" In Zone "VAV-1-59" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 67 W | 206 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 143 W | 466 | - | 0 | 0 | - |
| People | 1 | 202 | 120 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 44 | 6 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **917** | **126** | **-** | **0** | **0** |

| TABLE 59.4.B. Envelope Loads For Space "2046C EXAM" In Zone "VAV-1-59" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 60.1.A. Component Loads For Space "2042 INTERVIEW" In Zone "VAV-1-60" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 77 W | 238 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 165 W | 539 | - | 0 | 0 | - |
| People | 2 | 403 | 240 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 59 | 12 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1240** | **252** | **-** | **0** | **0** |

| TABLE 60.1.B. Envelope Loads For Space "2042 INTERVIEW" In Zone "VAV-1-60" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 61.1.A. Component Loads For Space "2026 CONFERENCE-SM" In Zone "VAV-1-61" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jun 1700<br>COOLING OA DB / WB 86.5 °F / 70.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 147 ft² | 3564 | - | 147 ft² | - | - |
| Wall Transmission | 74 ft² | 93 | - | 74 ft² | 284 | - |
| Roof Transmission | 194 ft² | 179 | - | 194 ft² | 321 | - |
| Window Transmission | 147 ft² | 534 | - | 147 ft² | 3435 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 149 W | 446 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 320 W | 1030 | - | 0 | 0 | - |
| People | 6 | 1232 | 1230 | 0 | 0 | 0 |
| Infiltration | - | 109 | 113 | - | 587 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 359 | 67 | 5% | 231 | 0 |
| **>> Total Zone Loads** | **-** | **7547** | **1410** | **-** | **4858** | **0** |

| TABLE 61.1.B. Envelope Loads For Space "2026 CONFERENCE-SM" In Zone "VAV-1-61" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 74 | 0.062 | - | 93 | - | 284 |
| WINDOW 1 | 147 | 0.380 | 0.333 | 534 | 3564 | 3435 |
| **H EXPOSURE** | | | | | | |
| ROOF | 194 | 0.027 | - | 179 | - | 321 |

| TABLE 62.1.A. Component Loads For Space "2027 RECORDS" In Zone "VAV-1-62" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 124 ft² | 150 | - | 124 ft² | 205 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 146 W | 427 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 29 | 0 | 5% | 10 | 0 |
| **>> Total Zone Loads** | **-** | **605** | **0** | **-** | **215** | **0** |

| TABLE 62.1.B. Envelope Loads For Space "2027 RECORDS" In Zone "VAV-1-62" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 124 | 0.027 | - | 150 | - | 205 |

| TABLE 63.1.A. Component Loads For Space "2025 WORKSPACE" In Zone "VAV-1-63" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 89 ft² | 2003 | - | 89 ft² | - | - |
| Wall Transmission | 126 ft² | 174 | - | 126 ft² | 483 | - |
| Roof Transmission | 413 ft² | 405 | - | 413 ft² | 683 | - |
| Window Transmission | 89 ft² | 425 | - | 89 ft² | 2080 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 289 W | 865 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 620 W | 1998 | - | 0 | 0 | - |
| People | 10 | 2053 | 2050 | 0 | 0 | 0 |
| Infiltration | - | 134 | 148 | - | 571 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 403 | 110 | 5% | 191 | 0 |
| **>> Total Zone Loads** | **-** | **8458** | **2308** | **-** | **4007** | **0** |

| TABLE 63.1.B. Envelope Loads For Space "2025 WORKSPACE" In Zone "VAV-1-63" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 126 | 0.062 | - | 174 | - | 483 |
| WINDOW 1 | 89 | 0.380 | 0.333 | 425 | 2003 | 2080 |
| **H EXPOSURE** | | | | | | |
| ROOF | 413 | 0.027 | - | 405 | - | 683 |

| TABLE 64.1.A. Component Loads For Space "2022 OFFICE-SPARE" In Zone "VAV-1-64" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 54 ft² | 1745 | - | 54 ft² | - | - |
| Wall Transmission | 281 ft² | 229 | - | 281 ft² | 1077 | - |
| Roof Transmission | 141 ft² | 115 | - | 141 ft² | 233 | - |
| Window Transmission | 54 ft² | 180 | - | 54 ft² | 1262 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 99 W | 289 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 212 W | 676 | - | 0 | 0 | - |
| People | 5 | 998 | 1025 | 0 | 0 | 0 |
| Infiltration | - | 166 | 168 | - | 889 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 220 | 60 | 5% | 173 | 0 |
| **>> Total Zone Loads** | **-** | **4618** | **1252** | **-** | **3634** | **0** |

| TABLE 64.1.B. Envelope Loads For Space "2022 OFFICE-SPARE" In Zone "VAV-1-64" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 205 | 0.062 | - | 105 | - | 786 |
| **SSW EXPOSURE** | | | | | | |
| WALL | 76 | 0.062 | - | 124 | - | 291 |
| WINDOW 1 | 54 | 0.380 | 0.333 | 180 | 1745 | 1262 |
| **H EXPOSURE** | | | | | | |
| ROOF | 141 | 0.027 | - | 115 | - | 233 |

| TABLE 65.1.A. Component Loads For Space "2020 CONFERENCE" In Zone "VAV-1-65" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 54 ft² | 1745 | - | 54 ft² | - | - |
| Wall Transmission | 70 ft² | 114 | - | 70 ft² | 268 | - |
| Roof Transmission | 148 ft² | 121 | - | 148 ft² | 245 | - |
| Window Transmission | 54 ft² | 180 | - | 54 ft² | 1262 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 104 W | 304 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 222 W | 710 | - | 0 | 0 | - |
| People | 5 | 998 | 1025 | 0 | 0 | 0 |
| Infiltration | - | 62 | 62 | - | 329 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 212 | 54 | 5% | 105 | 0 |
| **>> Total Zone Loads** | **-** | **4443** | **1141** | **-** | **2209** | **0** |

| TABLE 65.1.B. Envelope Loads For Space "2020 CONFERENCE" In Zone "VAV-1-65" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SSW EXPOSURE** | | | | | | |
| WALL | 70 | 0.062 | - | 114 | - | 268 |
| WINDOW 1 | 54 | 0.380 | 0.333 | 180 | 1745 | 1262 |
| **H EXPOSURE** | | | | | | |
| ROOF | 148 | 0.027 | - | 121 | - | 245 |

| TABLE 66.1.A. Component Loads For Space "2018 OFFICE-ASST. PR." In Zone "VAV-1-66" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 54 ft² | 1745 | - | 54 ft² | - | - |
| Wall Transmission | 68 ft² | 111 | - | 68 ft² | 261 | - |
| Roof Transmission | 145 ft² | 119 | - | 145 ft² | 240 | - |
| Window Transmission | 54 ft² | 180 | - | 54 ft² | 1262 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 102 W | 297 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 218 W | 695 | - | 0 | 0 | - |
| People | 5 | 998 | 1025 | 0 | 0 | 0 |
| Infiltration | - | 61 | 61 | - | 324 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 210 | 54 | 5% | 104 | 0 |
| **>> Total Zone Loads** | **-** | **4415** | **1140** | **-** | **2190** | **0** |

| TABLE 66.1.B. Envelope Loads For Space "2018 OFFICE-ASST. PR." In Zone "VAV-1-66" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SSW EXPOSURE** | | | | | | |
| WALL | 68 | 0.062 | - | 111 | - | 261 |
| WINDOW 1 | 54 | 0.380 | 0.333 | 180 | 1745 | 1262 |
| **H EXPOSURE** | | | | | | |
| ROOF | 145 | 0.027 | - | 119 | - | 240 |

| TABLE 67.1.A. Component Loads For Space "2016 CONFERENCE-LG" In Zone "VAV-1-67" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1400<br>COOLING OA DB / WB 86.0 °F / 70.4 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 289 ft² | 9544 | - | 289 ft² | - | - |
| Wall Transmission | 185 ft² | 164 | - | 185 ft² | 709 | - |
| Roof Transmission | 327 ft² | 253 | - | 327 ft² | 541 | - |
| Window Transmission | 289 ft² | 908 | - | 289 ft² | 6754 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 229 W | 663 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 491 W | 1561 | - | 0 | 0 | - |
| People | 8 | 1571 | 1640 | 0 | 0 | 0 |
| Infiltration | - | 226 | 237 | - | 1258 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 744 | 94 | 5% | 463 | 0 |
| **>> Total Zone Loads** | **-** | **15633** | **1971** | **-** | **9725** | **0** |

| TABLE 67.1.B. Envelope Loads For Space "2016 CONFERENCE-LG" In Zone "VAV-1-67" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SSW EXPOSURE** | | | | | | |
| WALL | 93 | 0.062 | - | 127 | - | 356 |
| WINDOW 1 | 289 | 0.380 | 0.333 | 908 | 9544 | 6754 |
| **NW EXPOSURE** | | | | | | |
| WALL | 92 | 0.062 | - | 37 | - | 353 |
| **NNE EXPOSURE** | | | | | | |
| ROOF | 327 | 0.027 | - | 253 | - | 541 |

| TABLE 68.1.A. Component Loads For Space "2014 OFFICE-PRINCIPAL" In Zone "VAV-1-68" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 79 ft² | 1606 | - | 79 ft² | - | - |
| Wall Transmission | 283 ft² | 430 | - | 283 ft² | 1085 | - |
| Roof Transmission | 418 ft² | 502 | - | 418 ft² | 691 | - |
| Window Transmission | 79 ft² | 383 | - | 79 ft² | 1846 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 293 W | 847 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 627 W | 1995 | - | 0 | 0 | - |
| People | 9 | 1767 | 1845 | 0 | 0 | 0 |
| Infiltration | - | 243 | 246 | - | 961 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 389 | 105 | 5% | 229 | 0 |
| **>> Total Zone Loads** | **-** | **8163** | **2196** | **-** | **4812** | **0** |

| TABLE 68.1.B. Envelope Loads For Space "2014 OFFICE-PRINCIPAL" In Zone "VAV-1-68" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **ESE EXPOSURE** | | | | | | |
| WALL | 283 | 0.062 | - | 430 | - | 1085 |
| WINDOW 1 | 79 | 0.380 | 0.333 | 383 | 1606 | 1846 |
| **NNE EXPOSURE** | | | | | | |
| ROOF | 418 | 0.027 | - | 502 | - | 691 |

| TABLE 69.1.A. Component Loads For Space "2012 OFFICE-PR SECRETARY" In Zone "VAV-1-69" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 9 ft² | 175 | - | 9 ft² | - | - |
| Wall Transmission | 52 ft² | 76 | - | 52 ft² | 199 | - |
| Roof Transmission | 46 ft² | 54 | - | 46 ft² | 76 | - |
| Window Transmission | 9 ft² | 45 | - | 9 ft² | 210 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 92 W | 271 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 198 W | 633 | - | 0 | 0 | - |
| People | 2 | 399 | 410 | 0 | 0 | 0 |
| Infiltration | - | 42 | 40 | - | 162 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 85 | 23 | 5% | 32 | 0 |
| **>> Total Zone Loads** | **-** | **1779** | **473** | **-** | **680** | **0** |

| TABLE 69.1.B. Envelope Loads For Space "2012 OFFICE-PR SECRETARY" In Zone "VAV-1-69" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **ESE EXPOSURE** | | | | | | |
| WALL | 52 | 0.062 | - | 76 | - | 199 |
| WINDOW 1 | 9 | 0.380 | 0.333 | 45 | 175 | 210 |
| **NNE EXPOSURE** | | | | | | |
| ROOF | 46 | 0.027 | - | 54 | - | 76 |

| TABLE 70.1.A. Component Loads For Space "2010 ADMIN-GENERAL" In Zone "Zone 70" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 272 W | 842 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 584 W | 1907 | - | 0 | 0 | - |
| People | 7 | 1503 | 1435 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 213 | 72 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **4465** | **1507** | **-** | **0** | **0** |

| TABLE 70.1.B. Envelope Loads For Space "2010 ADMIN-GENERAL" In Zone "Zone 70" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 70.2.A. Component Loads For Space "2010A COPY" In Zone "Zone 70" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 137 W | 424 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 1000 W | 3269 | - | 0 | 0 | - |
| People | 1 | 203 | 120 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 195 | 6 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **4091** | **126** | **-** | **0** | **0** |

| TABLE 70.2.B. Envelope Loads For Space "2010A COPY" In Zone "Zone 70" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 70.3.A. Component Loads For Space "2010B MAIL" In Zone "Zone 70" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 68 ft² | 79 | - | 68 ft² | 112 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 72 W | 211 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 1 | 200 | 205 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 24 | 10 | 5% | 6 | 0 |
| **>> Total Zone Loads** | **-** | **514** | **215** | **-** | **118** | **0** |

| TABLE 70.3.B. Envelope Loads For Space "2010B MAIL" In Zone "Zone 70" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NNE EXPOSURE** | | | | | | |
| ROOF | 68 | 0.027 | - | 79 | - | 112 |

| TABLE 70.4.A. Component Loads For Space "1246 CORRIDOR" In Zone "Zone 70" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 238 ft² | 294 | - | 238 ft² | 393 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 186 W | 539 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 42 | 0 | 5% | 20 | 0 |
| **>> Total Zone Loads** | **-** | **875** | **0** | **-** | **413** | **0** |

| TABLE 70.4.B. Envelope Loads For Space "1246 CORRIDOR" In Zone "Zone 70" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 238 | 0.027 | - | 294 | - | 393 |

| TABLE 70.5.A. Component Loads For Space "2025 WORKSPACE" In Zone "Zone 70" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 89 ft² | 2003 | - | 89 ft² | - | - |
| Wall Transmission | 126 ft² | 174 | - | 126 ft² | 483 | - |
| Roof Transmission | 413 ft² | 405 | - | 413 ft² | 683 | - |
| Window Transmission | 89 ft² | 425 | - | 89 ft² | 2080 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 289 W | 865 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 620 W | 1998 | - | 0 | 0 | - |
| People | 10 | 2053 | 2050 | 0 | 0 | 0 |
| Infiltration | - | 134 | 144 | - | 571 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 403 | 110 | 5% | 191 | 0 |
| **>> Total Zone Loads** | **-** | **8458** | **2304** | **-** | **4007** | **0** |

| TABLE 70.5.B. Envelope Loads For Space "2025 WORKSPACE" In Zone "Zone 70" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 126 | 0.062 | - | 174 | - | 483 |
| WINDOW 1 | 89 | 0.380 | 0.333 | 425 | 2003 | 2080 |
| **H EXPOSURE** | | | | | | |
| ROOF | 413 | 0.027 | - | 405 | - | 683 |

| TABLE 71.1.A. Component Loads For Space "3164 CLASSROOM-ELL" In Zone "Zone 71" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 185 ft² | 5440 | - | 185 ft² | - | - |
| Wall Transmission | 785 ft² | 1047 | - | 785 ft² | 3009 | - |
| Roof Transmission | 882 ft² | 897 | - | 882 ft² | 1458 | - |
| Window Transmission | 185 ft² | 923 | - | 185 ft² | 4323 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 882 ft² | 1158 | - | 882 ft² | 5424 | - |
| Partitions | 124 ft² | 0 | - | 124 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 617 W | 1829 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 441 W | 1416 | - | 0 | 0 | - |
| People | 26 | 5265 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 651 | 667 | - | 2574 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 931 | 300 | 5% | 839 | 0 |
| **>> Total Zone Loads** | **-** | **19556** | **6297** | **-** | **17628** | **-1** |

| TABLE 71.1.B. Envelope Loads For Space "3164 CLASSROOM-ELL" In Zone "Zone 71" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 441 | 0.062 | - | 467 | - | 1690 |
| **SW EXPOSURE** | | | | | | |
| WALL | 211 | 0.062 | - | 379 | - | 809 |
| WINDOW 1 | 185 | 0.380 | 0.333 | 923 | 5440 | 4323 |
| **W EXPOSURE** | | | | | | |
| WALL | 63 | 0.062 | - | 96 | - | 241 |
| **SE EXPOSURE** | | | | | | |
| WALL | 70 | 0.062 | - | 106 | - | 268 |
| **H EXPOSURE** | | | | | | |
| ROOF | 882 | 0.027 | - | 897 | - | 1458 |

| TABLE 72.1.A. Component Loads For Space "3160 CLASSROOM-ELL" In Zone "Zone 72" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 285 ft² | 9439 | - | 285 ft² | - | - |
| Wall Transmission | 258 ft² | 298 | - | 258 ft² | 989 | - |
| Roof Transmission | 883 ft² | 723 | - | 883 ft² | 1460 | - |
| Window Transmission | 285 ft² | 949 | - | 285 ft² | 6660 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 618 W | 1811 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 442 W | 1412 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 269 | 271 | - | 1441 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 1004 | 280 | 5% | 528 | 0 |
| **>> Total Zone Loads** | **-** | **21092** | **5881** | **-** | **11078** | **0** |

| TABLE 72.1.B. Envelope Loads For Space "3160 CLASSROOM-ELL" In Zone "Zone 72" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SW EXPOSURE** | | | | | | |
| WALL | 107 | 0.062 | - | 153 | - | 410 |
| WINDOW 1 | 285 | 0.380 | 0.333 | 949 | 9439 | 6660 |
| **W EXPOSURE** | | | | | | |
| WALL | 98 | 0.062 | - | 88 | - | 376 |
| **SE EXPOSURE** | | | | | | |
| WALL | 32 | 0.062 | - | 45 | - | 123 |
| **NW EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 11 | - | 80 |
| **H EXPOSURE** | | | | | | |
| ROOF | 883 | 0.027 | - | 723 | - | 1460 |

| TABLE 73.1.A. Component Loads For Space "3000A CORRIDOR (W)" In Zone "Zone 73" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jun 1500<br>COOLING OA DB / WB 88.0 °F / 71.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 456 ft² | 22652 | - | 456 ft² | - | - |
| Wall Transmission | 40 ft² | 42 | - | 40 ft² | 153 | - |
| Roof Transmission | 959 ft² | 1104 | - | 959 ft² | 1585 | - |
| Window Transmission | 163 ft² | 635 | - | 163 ft² | 3809 | - |
| Skylight Transmission | 293 ft² | 721 | - | 293 ft² | 4325 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1031 W | 3021 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 114 | 101 | - | 539 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 1415 | 5 | 5% | 521 | 0 |
| **>> Total Zone Loads** | **-** | **29705** | **106** | **-** | **10932** | **0** |

| TABLE 73.1.B. Envelope Loads For Space "3000A CORRIDOR (W)" In Zone "Zone 73" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **W EXPOSURE** | | | | | | |
| WALL | 40 | 0.062 | - | 42 | - | 153 |
| WINDOW 1 | 163 | 0.380 | 0.333 | 635 | 4652 | 3809 |
| **H EXPOSURE** | | | | | | |
| ROOF | 959 | 0.027 | - | 1104 | - | 1585 |
| SKYLIGHT | 293 | 0.240 | 0.448 | 721 | 18000 | 4325 |

| TABLE 73.2.A. Component Loads For Space "3150 TOILET (4 STALLS)" In Zone "Zone 73" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 26 ft² | 765 | - | 26 ft² | - | - |
| Wall Transmission | 133 ft² | 239 | - | 133 ft² | 510 | - |
| Roof Transmission | 193 ft² | 196 | - | 193 ft² | 319 | - |
| Window Transmission | 26 ft² | 130 | - | 26 ft² | 608 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 135 W | 400 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 107 | 110 | - | 422 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 92 | 5 | 5% | 93 | 0 |
| **>> Total Zone Loads** | **-** | **1928** | **115** | **-** | **1951** | **0** |

| TABLE 73.2.B. Envelope Loads For Space "3150 TOILET (4 STALLS)" In Zone "Zone 73" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SW EXPOSURE** | | | | | | |
| WALL | 133 | 0.062 | - | 239 | - | 510 |
| WINDOW 1 | 26 | 0.380 | 0.333 | 130 | 765 | 608 |
| **H EXPOSURE** | | | | | | |
| ROOF | 193 | 0.027 | - | 196 | - | 319 |

| TABLE 73.3.A. Component Loads For Space "3152 TOILET (1 STALL)" In Zone "Zone 73" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 54 ft² | 67 | - | 54 ft² | 89 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 38 W | 109 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 9 | 0 | 5% | 4 | 0 |
| **>> Total Zone Loads** | **-** | **185** | **0** | **-** | **94** | **0** |

| TABLE 73.3.B. Envelope Loads For Space "3152 TOILET (1 STALL)" In Zone "Zone 73" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 54 | 0.027 | - | 67 | - | 89 |

| TABLE 73.4.A. Component Loads For Space "3153 STOREROOM" In Zone "Zone 73" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 88 ft² | 109 | - | 88 ft² | 145 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 62 W | 178 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 14 | 0 | 5% | 7 | 0 |
| **>> Total Zone Loads** | **-** | **301** | **0** | **-** | **153** | **0** |

| TABLE 73.4.B. Envelope Loads For Space "3153 STOREROOM" In Zone "Zone 73" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 88 | 0.027 | - | 109 | - | 145 |

| TABLE 73.5.A. Component Loads For Space "3154 TOILET (1 STALL)" In Zone "Zone 73" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 54 ft² | 67 | - | 54 ft² | 89 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 38 W | 109 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 9 | 0 | 5% | 4 | 0 |
| **>> Total Zone Loads** | **-** | **185** | **0** | **-** | **94** | **0** |

| TABLE 73.5.B. Envelope Loads For Space "3154 TOILET (1 STALL)" In Zone "Zone 73" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 54 | 0.027 | - | 67 | - | 89 |

| TABLE 73.6.A. Component Loads For Space "3156 TOILET (4 STALLS)" In Zone "Zone 73" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 26 ft² | 765 | - | 26 ft² | - | - |
| Wall Transmission | 113 ft² | 203 | - | 113 ft² | 433 | - |
| Roof Transmission | 182 ft² | 185 | - | 182 ft² | 301 | - |
| Window Transmission | 26 ft² | 130 | - | 26 ft² | 608 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 127 W | 377 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 93 | 96 | - | 369 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 88 | 5 | 5% | 86 | 0 |
| **>> Total Zone Loads** | **-** | **1841** | **101** | **-** | **1796** | **0** |

| TABLE 73.6.B. Envelope Loads For Space "3156 TOILET (4 STALLS)" In Zone "Zone 73" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SW EXPOSURE** | | | | | | |
| WALL | 113 | 0.062 | - | 203 | - | 433 |
| WINDOW 1 | 26 | 0.380 | 0.333 | 130 | 765 | 608 |
| **H EXPOSURE** | | | | | | |
| ROOF | 182 | 0.027 | - | 185 | - | 301 |

| TABLE 74.1.A. Component Loads For Space "3058 BREAKOUT" In Zone "Zone 74" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jun 1400<br>COOLING OA DB / WB 87.5 °F / 70.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 222 ft² | 11866 | - | 222 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 17 ft² | 20 | - | 17 ft² | 28 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 222 ft² | 520 | - | 222 ft² | 3277 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 167 W | 485 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 120 W | 380 | - | 0 | 0 | - |
| People | 8 | 1571 | 1640 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 742 | 82 | 5% | 165 | 0 |
| **>> Total Zone Loads** | **-** | **15584** | **1722** | **-** | **3470** | **0** |

| TABLE 74.1.B. Envelope Loads For Space "3058 BREAKOUT" In Zone "Zone 74" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 17 | 0.027 | - | 20 | - | 28 |
| **NW EXPOSURE** | | | | | | |
| SKYLIGHT | 118 | 0.240 | 0.448 | 277 | 5969 | 1742 |
| **SE EXPOSURE** | | | | | | |
| SKYLIGHT | 104 | 0.240 | 0.448 | 244 | 5897 | 1535 |

| TABLE 75.1.A. Component Loads For Space "3144 CLASSROOM" In Zone "Zone 75" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 158 ft² | 4646 | - | 158 ft² | - | - |
| Wall Transmission | 367 ft² | 622 | - | 367 ft² | 1407 | - |
| Roof Transmission | 886 ft² | 901 | - | 886 ft² | 1465 | - |
| Window Transmission | 158 ft² | 788 | - | 158 ft² | 3692 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 620 W | 1837 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 443 W | 1423 | - | 0 | 0 | - |
| People | 26 | 5265 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 352 | 360 | - | 1393 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 792 | 284 | 5% | 398 | 0 |
| **>> Total Zone Loads** | **-** | **16625** | **5974** | **-** | **8355** | **0** |

| TABLE 75.1.B. Envelope Loads For Space "3144 CLASSROOM" In Zone "Zone 75" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **W EXPOSURE** | | | | | | |
| WALL | 63 | 0.062 | - | 96 | - | 241 |
| **SW EXPOSURE** | | | | | | |
| WALL | 234 | 0.062 | - | 420 | - | 897 |
| WINDOW 1 | 158 | 0.380 | 0.333 | 788 | 4646 | 3692 |
| **SE EXPOSURE** | | | | | | |
| WALL | 70 | 0.062 | - | 106 | - | 268 |
| **H EXPOSURE** | | | | | | |
| ROOF | 886 | 0.027 | - | 901 | - | 1465 |

| TABLE 76.1.A. Component Loads For Space "3142 CLASSROOM-TP" In Zone "Zone 76" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 95 ft² | 106 | - | 95 ft² | 157 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 67 W | 197 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 48 W | 153 | - | 0 | 0 | - |
| People | 2 | 405 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 43 | 21 | 5% | 8 | 0 |
| **>> Total Zone Loads** | **-** | **904** | **431** | **-** | **165** | **0** |

| TABLE 76.1.B. Envelope Loads For Space "3142 CLASSROOM-TP" In Zone "Zone 76" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 95 | 0.027 | - | 106 | - | 157 |

| TABLE 77.1.A. Component Loads For Space "3140 CLASSROOM" In Zone "Zone 77" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 185 ft² | 5977 | - | 185 ft² | - | - |
| Wall Transmission | 319 ft² | 478 | - | 319 ft² | 1223 | - |
| Roof Transmission | 889 ft² | 728 | - | 889 ft² | 1470 | - |
| Window Transmission | 185 ft² | 616 | - | 185 ft² | 4323 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 622 W | 1823 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 445 W | 1421 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 250 | 250 | - | 1338 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 824 | 279 | 5% | 418 | 0 |
| **>> Total Zone Loads** | **-** | **17305** | **5859** | **-** | **8771** | **0** |

| TABLE 77.1.B. Envelope Loads For Space "3140 CLASSROOM" In Zone "Zone 77" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SW EXPOSURE** | | | | | | |
| WALL | 63 | 0.062 | - | 90 | - | 241 |
| **W EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 19 | - | 80 |
| **SSW EXPOSURE** | | | | | | |
| WALL | 207 | 0.062 | - | 337 | - | 793 |
| WINDOW 1 | 185 | 0.380 | 0.333 | 616 | 5977 | 4323 |
| **ESE EXPOSURE** | | | | | | |
| WALL | 28 | 0.062 | - | 33 | - | 107 |
| **H EXPOSURE** | | | | | | |
| ROOF | 889 | 0.027 | - | 728 | - | 1470 |

| TABLE 78.1.A. Component Loads For Space "1140 KITCHEN" In Zone "Zone 78" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1553 ft² | 0 | - | 1553 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1087 W | 3361 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 1553 W | 5077 | - | 0 | 0 | - |
| People | 8 | 2069 | 3640 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 525 | 182 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **11032** | **3822** | **-** | **0** | **0** |

| TABLE 78.1.B. Envelope Loads For Space "1140 KITCHEN" In Zone "Zone 78" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 78.2.A. Component Loads For Space "1142 KITCHEN TOILET" In Zone "Zone 78" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 49 ft² | 0 | - | 49 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 34 W | 106 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 5 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **111** | **0** | **-** | **0** | **0** |

| TABLE 78.2.B. Envelope Loads For Space "1142 KITCHEN TOILET" In Zone "Zone 78" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 78.3.A. Component Loads For Space "1147 KITCHEN STORAGE" In Zone "Zone 78" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 92 ft² | 0 | - | 92 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 64 W | 199 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 10 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **209** | **0** | **-** | **0** | **0** |

| TABLE 78.3.B. Envelope Loads For Space "1147 KITCHEN STORAGE" In Zone "Zone 78" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 1.1.A. Component Loads For Space "1240 MEDIA CENTER" In Zone "1" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 543 ft² | 7186 | - | 543 ft² | - | - |
| Wall Transmission | 1795 ft² | 2185 | - | 1795 ft² | 6879 | - |
| Roof Transmission | 1107 ft² | 1335 | - | 1107 ft² | 1830 | - |
| Window Transmission | 543 ft² | 2736 | - | 543 ft² | 12690 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1881 ft² | 0 | - | 1881 ft² | 2054 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1317 W | 3858 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 2822 W | 9021 | - | 0 | 0 | - |
| People | 30 | 5985 | 6150 | 0 | 0 | 0 |
| Infiltration | - | 1614 | 1597 | - | 6205 | -1 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 1696 | 387 | 5% | 1483 | 0 |
| **>> Total Zone Loads** | **-** | **35616** | **8135** | **-** | **31141** | **-1** |

| TABLE 1.1.B. Envelope Loads For Space "1240 MEDIA CENTER" In Zone "1" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NNE EXPOSURE** | | | | | | |
| WALL | 395 | 0.062 | - | 381 | - | 1514 |
| WINDOW 1 | 543 | 0.380 | 0.437 | 2736 | 7186 | 12690 |
| **WNW EXPOSURE** | | | | | | |
| WALL | 686 | 0.062 | - | 741 | - | 2629 |
| **SE EXPOSURE** | | | | | | |
| WALL | 714 | 0.062 | - | 1063 | - | 2736 |
| **H EXPOSURE** | | | | | | |
| ROOF | 1107 | 0.027 | - | 1335 | - | 1830 |

| TABLE 2.1.A. Component Loads For Space "1242 MEDIA OFFICE" In Zone "2" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 98 ft² | 0 | - | 98 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 147 W | 481 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 56 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1178** | **431** | **-** | **0** | **0** |

| TABLE 2.1.B. Envelope Loads For Space "1242 MEDIA OFFICE" In Zone "2" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 3.1.A. Component Loads For Space "1055B CAF/LEARN COMM" In Zone "3" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jun 1400<br>COOLING OA DB / WB 87.5 °F / 70.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 1524 ft² | 96581 | - | 1524 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 814 ft² | 962 | - | 814 ft² | 1346 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 1524 ft² | 3571 | - | 1524 ft² | 22494 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 2338 ft² | 0 | - | 2338 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1637 W | 4740 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 585 W | 1860 | - | 0 | 0 | - |
| People | 200 | 36859 | 24000 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 7229 | 1200 | 5% | 1192 | 0 |
| **>> Total Zone Loads** | **-** | **151802** | **25200** | **-** | **25032** | **0** |

| TABLE 3.1.B. Envelope Loads For Space "1055B CAF/LEARN COMM" In Zone "3" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 814 | 0.027 | - | 962 | - | 1346 |
| SKYLIGHT | 1524 | 0.240 | 0.448 | 3571 | 96581 | 22494 |

| TABLE 4.1.A. Component Loads For Space "1244 CLASSROOM" In Zone "4" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 3373 | - | 190 ft² | - | - |
| Wall Transmission | 272 ft² | 315 | - | 272 ft² | 1042 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 190 ft² | 957 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 904 ft² | 0 | - | 904 ft² | 949 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 633 W | 1854 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 452 W | 1445 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 319 | 310 | - | 1226 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 673 | 282 | 5% | 383 | 0 |
| **>> Total Zone Loads** | **-** | **14124** | **5922** | **-** | **8041** | **0** |

| TABLE 4.1.B. Envelope Loads For Space "1244 CLASSROOM" In Zone "4" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 202 | 0.062 | - | 224 | - | 774 |
| WINDOW 1 | 190 | 0.380 | 0.437 | 957 | 3373 | 4440 |
| **E EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 78 | - | 215 |
| **NW EXPOSURE** | | | | | | |
| WALL | 14 | 0.062 | - | 13 | - | 54 |

| TABLE 5.1.A. Component Loads For Space "1060B CORRIDOR (E)" In Zone "5" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 0900<br>COOLING OA DB / WB 80.1 °F / 69.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 122 ft² | 3428 | - | 122 ft² | - | - |
| Wall Transmission | 81 ft² | 94 | - | 81 ft² | 310 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 122 ft² | 243 | - | 122 ft² | 2851 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1473 ft² | 0 | - | 1473 ft² | 786 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1031 W | 2771 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 45 | 135 | - | 539 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 329 | 7 | 5% | 224 | 0 |
| **>> Total Zone Loads** | **-** | **6910** | **142** | **-** | **4710** | **0** |

| TABLE 5.1.B. Envelope Loads For Space "1060B CORRIDOR (E)" In Zone "5" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **E EXPOSURE** | | | | | | |
| WALL | 81 | 0.062 | - | 94 | - | 310 |
| WINDOW 1 | 122 | 0.380 | 0.333 | 243 | 3428 | 2851 |

| TABLE 5.2.A. Component Loads For Space "1250 TOILET (4 STALLS)" In Zone "5" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 31 ft² | 571 | - | 31 ft² | - | - |
| Wall Transmission | 128 ft² | 139 | - | 128 ft² | 491 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 31 ft² | 150 | - | 31 ft² | 724 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 246 ft² | 0 | - | 246 ft² | 284 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 172 W | 499 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 107 | 109 | - | 422 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 73 | 5 | 5% | 96 | 0 |
| **>> Total Zone Loads** | **-** | **1539** | **114** | **-** | **2018** | **0** |

| TABLE 5.2.B. Envelope Loads For Space "1250 TOILET (4 STALLS)" In Zone "5" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 128 | 0.062 | - | 139 | - | 491 |
| WINDOW 1 | 31 | 0.380 | 0.437 | 150 | 571 | 724 |

| TABLE 5.3.A. Component Loads For Space "1252 SPED TLT (1 STALL)" In Zone "5" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 101 ft² | 0 | - | 101 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 71 W | 219 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 11 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **230** | **0** | **-** | **0** | **0** |

| TABLE 5.3.B. Envelope Loads For Space "1252 SPED TLT (1 STALL)" In Zone "5" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 5.4.A. Component Loads For Space "1253 CUST STOR" In Zone "5" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 84 ft² | 97 | - | 84 ft² | 322 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 146 ft² | 0 | - | 146 ft² | 158 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 102 W | 306 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 52 | 58 | - | 223 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 23 | 3 | 5% | 35 | 0 |
| **>> Total Zone Loads** | **-** | **478** | **61** | **-** | **738** | **0** |

| TABLE 5.4.B. Envelope Loads For Space "1253 CUST STOR" In Zone "5" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 84 | 0.062 | - | 97 | - | 322 |

| TABLE 5.5.A. Component Loads For Space "1254 EMERG. ELEC" In Zone "5" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 13 ft² | 0 | - | 13 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 9 W | 28 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 1 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **30** | **0** | **-** | **0** | **0** |

| TABLE 5.5.B. Envelope Loads For Space "1254 EMERG. ELEC" In Zone "5" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 5.6.A. Component Loads For Space "1256 TOILET (4 STALLS)" In Zone "5" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 31 ft² | 571 | - | 31 ft² | - | - |
| Wall Transmission | 109 ft² | 118 | - | 109 ft² | 418 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 31 ft² | 150 | - | 31 ft² | 724 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 231 ft² | 0 | - | 231 ft² | 257 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 162 W | 468 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 94 | 96 | - | 372 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 70 | 5 | 5% | 89 | 0 |
| **>> Total Zone Loads** | **-** | **1472** | **101** | **-** | **1859** | **0** |

| TABLE 5.6.B. Envelope Loads For Space "1256 TOILET (4 STALLS)" In Zone "5" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 109 | 0.062 | - | 118 | - | 418 |
| WINDOW 1 | 31 | 0.380 | 0.437 | 150 | 571 | 724 |

| TABLE 6.1.A. Component Loads For Space "1260 SPED CLASSROOM" In Zone "6" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 3373 | - | 190 ft² | - | - |
| Wall Transmission | 300 ft² | 353 | - | 300 ft² | 1150 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 190 ft² | 957 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 866 ft² | 0 | - | 866 ft² | 964 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 606 W | 1776 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 433 W | 1384 | - | 0 | 0 | - |
| People | 26 | 4870 | 3120 | 0 | 0 | 0 |
| Infiltration | - | 338 | 329 | - | 1300 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 653 | 172 | 5% | 393 | 0 |
| **>> Total Zone Loads** | **-** | **13704** | **3622** | **-** | **8247** | **0** |

| TABLE 6.1.B. Envelope Loads For Space "1260 SPED CLASSROOM" In Zone "6" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 202 | 0.062 | - | 224 | - | 774 |
| WINDOW 1 | 190 | 0.380 | 0.437 | 957 | 3373 | 4440 |
| **E EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 78 | - | 215 |
| **ESE EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 31 | - | 80 |
| **NW EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 20 | - | 80 |

| TABLE 7.1.A. Component Loads For Space "1262 SPED-TP" In Zone "7" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 98 ft² | 0 | - | 98 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 250 W | 817 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 73 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1532** | **431** | **-** | **0** | **0** |

| TABLE 7.1.B. Envelope Loads For Space "1262 SPED-TP" In Zone "7" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 8.1.A. Component Loads For Space "1264 SPED CLASSROOM" In Zone "8" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 3373 | - | 190 ft² | - | - |
| Wall Transmission | 763 ft² | 1016 | - | 763 ft² | 2924 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 190 ft² | 957 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 870 ft² | 0 | - | 870 ft² | 1303 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 609 W | 1784 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 435 W | 1391 | - | 0 | 0 | - |
| People | 26 | 4870 | 3120 | 0 | 0 | 0 |
| Infiltration | - | 658 | 648 | - | 2529 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 702 | 188 | 5% | 560 | 0 |
| **>> Total Zone Loads** | **-** | **14752** | **3956** | **-** | **11757** | **0** |

| TABLE 8.1.B. Envelope Loads For Space "1264 SPED CLASSROOM" In Zone "8" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 202 | 0.062 | - | 224 | - | 774 |
| WINDOW 1 | 190 | 0.380 | 0.437 | 957 | 3373 | 4440 |
| **E EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 78 | - | 215 |
| **NW EXPOSURE** | | | | | | |
| WALL | 71 | 0.062 | - | 68 | - | 272 |
| **SE EXPOSURE** | | | | | | |
| WALL | 434 | 0.062 | - | 646 | - | 1663 |

| TABLE 9.1.A. Component Loads For Space "2242 CLASSROOM-TP" In Zone "9" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 67 W | 208 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 48 W | 157 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 40 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **834** | **431** | **-** | **0** | **0** |

| TABLE 9.1.B. Envelope Loads For Space "2242 CLASSROOM-TP" In Zone "9" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 10.1.A. Component Loads For Space "2244 CLASSROOM" In Zone "10" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 144 ft² | 2556 | - | 144 ft² | - | - |
| Wall Transmission | 289 ft² | 336 | - | 289 ft² | 1108 | - |
| Roof Transmission | 35 ft² | 42 | - | 35 ft² | 58 | - |
| Window Transmission | 144 ft² | 726 | - | 144 ft² | 3365 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 630 W | 1846 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 450 W | 1439 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 299 | 289 | - | 1149 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 622 | 281 | 5% | 284 | 0 |
| **>> Total Zone Loads** | **-** | **13053** | **5900** | **-** | **5964** | **0** |

| TABLE 10.1.B. Envelope Loads For Space "2244 CLASSROOM" In Zone "10" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 233 | 0.062 | - | 258 | - | 893 |
| WINDOW 1 | 144 | 0.380 | 0.437 | 726 | 2556 | 3365 |
| **E EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 78 | - | 215 |
| **H EXPOSURE** | | | | | | |
| ROOF | 35 | 0.027 | - | 42 | - | 58 |

| TABLE 11.1.A. Component Loads For Space "2250 TOILET (4 STALLS)" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 26 ft² | 479 | - | 26 ft² | - | - |
| Wall Transmission | 128 ft² | 139 | - | 128 ft² | 491 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 26 ft² | 126 | - | 26 ft² | 608 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 163 W | 472 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 103 | 99 | - | 409 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 66 | 5 | 5% | 75 | 0 |
| **>> Total Zone Loads** | **-** | **1386** | **104** | **-** | **1582** | **0** |

| TABLE 11.1.B. Envelope Loads For Space "2250 TOILET (4 STALLS)" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 128 | 0.062 | - | 139 | - | 491 |
| WINDOW 1 | 26 | 0.380 | 0.437 | 126 | 479 | 608 |

| TABLE 11.2.A. Component Loads For Space "2252 SPED-TLT (1 STALL)" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 71 W | 219 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 11 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **230** | **0** | **-** | **0** | **0** |

| TABLE 11.2.B. Envelope Loads For Space "2252 SPED-TLT (1 STALL)" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 11.3.A. Component Loads For Space "2253 CUSTODIAN STORAGE" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 68 W | 210 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 10 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **220** | **0** | **-** | **0** | **0** |

| TABLE 11.3.B. Envelope Loads For Space "2253 CUSTODIAN STORAGE" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 11.4.A. Component Loads For Space "2254 EMERG. ELECTRIC" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 9 W | 28 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 1 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **30** | **0** | **-** | **0** | **0** |

| TABLE 11.4.B. Envelope Loads For Space "2254 EMERG. ELECTRIC" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 11.5.A. Component Loads For Space "2255 IDF" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 2100<br>COOLING OA DB / WB 82.1 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 51 ft² | 50 | - | 51 ft² | 195 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 33 W | 102 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 1000 W | 3269 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 16 | 34 | - | 135 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 172 | 2 | 5% | 17 | 0 |
| **>> Total Zone Loads** | **-** | **3609** | **36** | **-** | **347** | **0** |

| TABLE 11.5.B. Envelope Loads For Space "2255 IDF" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 51 | 0.062 | - | 50 | - | 195 |

| TABLE 11.6.A. Component Loads For Space "2256 TOILET (4 STALLS)" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 26 ft² | 479 | - | 26 ft² | - | - |
| Wall Transmission | 128 ft² | 139 | - | 128 ft² | 491 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 26 ft² | 126 | - | 26 ft² | 608 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 160 W | 462 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 103 | 99 | - | 409 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 65 | 5 | 5% | 75 | 0 |
| **>> Total Zone Loads** | **-** | **1375** | **104** | **-** | **1582** | **0** |

| TABLE 11.6.B. Envelope Loads For Space "2256 TOILET (4 STALLS)" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 128 | 0.062 | - | 139 | - | 491 |
| WINDOW 1 | 26 | 0.380 | 0.437 | 126 | 479 | 608 |

| TABLE 11.7.A. Component Loads For Space "2060B CORRIDOR (E)" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 0900<br>COOLING OA DB / WB 80.1 °F / 69.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 139 ft² | 3905 | - | 139 ft² | - | - |
| Wall Transmission | 50 ft² | 58 | - | 50 ft² | 192 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 139 ft² | 277 | - | 139 ft² | 3248 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1018 W | 2735 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 42 | 117 | - | 502 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 351 | 6 | 5% | 197 | 0 |
| **>> Total Zone Loads** | **-** | **7369** | **123** | **-** | **4139** | **0** |

| TABLE 11.7.B. Envelope Loads For Space "2060B CORRIDOR (E)" In Zone "11" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **E EXPOSURE** | | | | | | |
| WALL | 50 | 0.062 | - | 58 | - | 192 |
| WINDOW 1 | 139 | 0.380 | 0.333 | 277 | 3905 | 3248 |

| TABLE 12.1.A. Component Loads For Space "2260 SPED-CLASSROOM" In Zone "12" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 3373 | - | 190 ft² | - | - |
| Wall Transmission | 307 ft² | 359 | - | 307 ft² | 1177 | - |
| Roof Transmission | 20 ft² | 24 | - | 20 ft² | 33 | - |
| Window Transmission | 190 ft² | 957 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 606 W | 1776 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 433 W | 1384 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 343 | 335 | - | 1319 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 670 | 283 | 5% | 348 | 0 |
| **>> Total Zone Loads** | **-** | **14075** | **5948** | **-** | **7317** | **0** |

| TABLE 12.1.B. Envelope Loads For Space "2260 SPED-CLASSROOM" In Zone "12" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 202 | 0.062 | - | 224 | - | 774 |
| WINDOW 1 | 190 | 0.380 | 0.437 | 957 | 3373 | 4440 |
| **E EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 78 | - | 215 |
| **NW EXPOSURE** | | | | | | |
| WALL | 28 | 0.062 | - | 27 | - | 107 |
| **ESE EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 31 | - | 80 |
| **H EXPOSURE** | | | | | | |
| ROOF | 20 | 0.027 | - | 24 | - | 33 |

| TABLE 13.1.A. Component Loads For Space "2262 SPED-TP" In Zone "13" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 49 W | 160 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 40 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **842** | **431** | **-** | **0** | **0** |

| TABLE 13.1.B. Envelope Loads For Space "2262 SPED-TP" In Zone "13" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 14.1.A. Component Loads For Space "2264 SPED-CLASSROOM" In Zone "14" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 3373 | - | 190 ft² | - | - |
| Wall Transmission | 655 ft² | 893 | - | 655 ft² | 2510 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 190 ft² | 957 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 610 W | 1787 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 436 W | 1392 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 583 | 574 | - | 2243 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 709 | 295 | 5% | 460 | 0 |
| **>> Total Zone Loads** | **-** | **14881** | **6200** | **-** | **9653** | **0** |

| TABLE 14.1.B. Envelope Loads For Space "2264 SPED-CLASSROOM" In Zone "14" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 202 | 0.062 | - | 224 | - | 774 |
| WINDOW 1 | 190 | 0.380 | 0.437 | 957 | 3373 | 4440 |
| **E EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 78 | - | 215 |
| **SE EXPOSURE** | | | | | | |
| WALL | 397 | 0.062 | - | 591 | - | 1522 |

| TABLE 15.1.A. Component Loads For Space "3240 CLASSROOM" In Zone "15" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 185 ft² | 2448 | - | 185 ft² | - | - |
| Wall Transmission | 312 ft² | 334 | - | 312 ft² | 1196 | - |
| Roof Transmission | 869 ft² | 1048 | - | 869 ft² | 1437 | - |
| Window Transmission | 185 ft² | 932 | - | 185 ft² | 4323 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 608 W | 1782 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 435 W | 1389 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 343 | 339 | - | 1319 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 673 | 283 | 5% | 414 | 0 |
| **>> Total Zone Loads** | **-** | **14138** | **5952** | **-** | **8688** | **0** |

| TABLE 15.1.B. Envelope Loads For Space "3240 CLASSROOM" In Zone "15" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NNE EXPOSURE** | | | | | | |
| WALL | 207 | 0.062 | - | 200 | - | 793 |
| WINDOW 1 | 185 | 0.380 | 0.437 | 932 | 2448 | 4323 |
| **ENE EXPOSURE** | | | | | | |
| WALL | 63 | 0.062 | - | 80 | - | 241 |
| **W EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 26 | - | 80 |
| **E EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 29 | - | 80 |
| **H EXPOSURE** | | | | | | |
| ROOF | 869 | 0.027 | - | 1048 | - | 1437 |

| TABLE 16.1.A. Component Loads For Space "3054 BREAKOUT" In Zone "16" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jun 1600<br>COOLING OA DB / WB 87.5 °F / 70.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 189 ft² | 10441 | - | 189 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 9 ft² | 10 | - | 9 ft² | 15 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 189 ft² | 459 | - | 189 ft² | 2790 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 137 W | 406 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 98 W | 315 | - | 0 | 0 | - |
| People | 8 | 1620 | 1640 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 663 | 82 | 5% | 140 | 0 |
| **>> Total Zone Loads** | **-** | **13914** | **1722** | **-** | **2945** | **0** |

| TABLE 16.1.B. Envelope Loads For Space "3054 BREAKOUT" In Zone "16" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 9 | 0.027 | - | 10 | - | 15 |
| **NW EXPOSURE** | | | | | | |
| SKYLIGHT | 107 | 0.240 | 0.448 | 260 | 5682 | 1579 |
| **WNW EXPOSURE** | | | | | | |
| SKYLIGHT | 82 | 0.240 | 0.448 | 199 | 4759 | 1210 |

| TABLE 17.1.A. Component Loads For Space "3242 CLASSROOM-TP" In Zone "17" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 95 ft² | 106 | - | 95 ft² | 157 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 67 W | 197 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 48 W | 153 | - | 0 | 0 | - |
| People | 2 | 405 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 43 | 21 | 5% | 8 | 0 |
| **>> Total Zone Loads** | **-** | **904** | **431** | **-** | **165** | **0** |

| TABLE 17.1.B. Envelope Loads For Space "3242 CLASSROOM-TP" In Zone "17" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 95 | 0.027 | - | 106 | - | 157 |

| TABLE 18.1.A. Component Loads For Space "3244 CLASSROOM" In Zone "18" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 185 ft² | 3284 | - | 185 ft² | - | - |
| Wall Transmission | 340 ft² | 393 | - | 340 ft² | 1303 | - |
| Roof Transmission | 873 ft² | 1053 | - | 873 ft² | 1443 | - |
| Window Transmission | 185 ft² | 932 | - | 185 ft² | 4323 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 17 ft² | 23 | - | 17 ft² | 105 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 611 W | 1791 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 437 W | 1396 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 362 | 357 | - | 1393 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 721 | 284 | 5% | 428 | 0 |
| **>> Total Zone Loads** | **-** | **15142** | **5971** | **-** | **8997** | **0** |

| TABLE 18.1.B. Envelope Loads For Space "3244 CLASSROOM" In Zone "18" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 207 | 0.062 | - | 229 | - | 793 |
| WINDOW 1 | 185 | 0.380 | 0.437 | 932 | 3284 | 4323 |
| **E EXPOSURE** | | | | | | |
| WALL | 63 | 0.062 | - | 88 | - | 241 |
| **WNW EXPOSURE** | | | | | | |
| WALL | 70 | 0.062 | - | 76 | - | 268 |
| **H EXPOSURE** | | | | | | |
| ROOF | 873 | 0.027 | - | 1053 | - | 1443 |

| TABLE 19.1.A. Component Loads For Space "3250 TOILET (4 STALLS)" In Zone "19" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 26 ft² | 479 | - | 26 ft² | - | - |
| Wall Transmission | 132 ft² | 143 | - | 132 ft² | 506 | - |
| Roof Transmission | 234 ft² | 289 | - | 234 ft² | 387 | - |
| Window Transmission | 26 ft² | 126 | - | 26 ft² | 608 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 164 W | 474 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 106 | 106 | - | 419 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 81 | 5 | 5% | 96 | 0 |
| **>> Total Zone Loads** | **-** | **1699** | **111** | **-** | **2016** | **0** |

| TABLE 19.1.B. Envelope Loads For Space "3250 TOILET (4 STALLS)" In Zone "19" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 132 | 0.062 | - | 143 | - | 506 |
| WINDOW 1 | 26 | 0.380 | 0.437 | 126 | 479 | 608 |
| **H EXPOSURE** | | | | | | |
| ROOF | 234 | 0.027 | - | 289 | - | 387 |

| TABLE 19.2.A. Component Loads For Space "3252 SPED-TLT (1 STALL)" In Zone "19" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 101 ft² | 125 | - | 101 ft² | 167 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 71 W | 205 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 16 | 0 | 5% | 8 | 0 |
| **>> Total Zone Loads** | **-** | **346** | **0** | **-** | **175** | **0** |

| TABLE 19.2.B. Envelope Loads For Space "3252 SPED-TLT (1 STALL)" In Zone "19" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 101 | 0.027 | - | 125 | - | 167 |

| TABLE 19.3.A. Component Loads For Space "3253 CUST STOR" In Zone "19" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 84 ft² | 93 | - | 84 ft² | 322 | - |
| Roof Transmission | 149 ft² | 180 | - | 149 ft² | 246 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 104 W | 306 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 58 | 57 | - | 223 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 32 | 3 | 5% | 40 | 0 |
| **>> Total Zone Loads** | **-** | **668** | **60** | **-** | **831** | **0** |

| TABLE 19.3.B. Envelope Loads For Space "3253 CUST STOR" In Zone "19" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 84 | 0.062 | - | 93 | - | 322 |
| **H EXPOSURE** | | | | | | |
| ROOF | 149 | 0.027 | - | 180 | - | 246 |

| TABLE 19.4.A. Component Loads For Space "3254 EMERG. ELECTRIC" In Zone "19" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 13 ft² | 16 | - | 13 ft² | 21 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 9 W | 26 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 2 | 0 | 5% | 1 | 0 |
| **>> Total Zone Loads** | **-** | **45** | **0** | **-** | **23** | **0** |

| TABLE 19.4.B. Envelope Loads For Space "3254 EMERG. ELECTRIC" In Zone "19" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 13 | 0.027 | - | 16 | - | 21 |

| TABLE 19.5.A. Component Loads For Space "3256 TOILET (4 STALLS)" In Zone "19" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 26 ft² | 479 | - | 26 ft² | - | - |
| Wall Transmission | 121 ft² | 131 | - | 121 ft² | 464 | - |
| Roof Transmission | 232 ft² | 287 | - | 232 ft² | 384 | - |
| Window Transmission | 26 ft² | 126 | - | 26 ft² | 608 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 162 W | 470 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 99 | 99 | - | 390 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 80 | 5 | 5% | 92 | 0 |
| **>> Total Zone Loads** | **-** | **1672** | **103** | **-** | **1937** | **0** |

| TABLE 19.5.B. Envelope Loads For Space "3256 TOILET (4 STALLS)" In Zone "19" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 121 | 0.062 | - | 131 | - | 464 |
| WINDOW 1 | 26 | 0.380 | 0.437 | 126 | 479 | 608 |
| **H EXPOSURE** | | | | | | |
| ROOF | 232 | 0.027 | - | 287 | - | 384 |

| TABLE 19.6.A. Component Loads For Space "3060B CORRIDOR (E)" In Zone "19" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jun 1400<br>COOLING OA DB / WB 87.5 °F / 70.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 412 ft² | 20962 | - | 412 ft² | - | - |
| Wall Transmission | 84 ft² | 105 | - | 84 ft² | 322 | - |
| Roof Transmission | 1254 ft² | 1483 | - | 1254 ft² | 2073 | - |
| Window Transmission | 119 ft² | 442 | - | 119 ft² | 2781 | - |
| Skylight Transmission | 293 ft² | 687 | - | 293 ft² | 4325 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1014 W | 2936 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 110 | 99 | - | 539 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 1336 | 5 | 5% | 502 | 0 |
| **>> Total Zone Loads** | **-** | **28060** | **104** | **-** | **10541** | **0** |

| TABLE 19.6.B. Envelope Loads For Space "3060B CORRIDOR (E)" In Zone "19" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **E EXPOSURE** | | | | | | |
| WALL | 84 | 0.062 | - | 105 | - | 322 |
| WINDOW 1 | 119 | 0.380 | 0.333 | 442 | 2394 | 2781 |
| **H EXPOSURE** | | | | | | |
| ROOF | 1254 | 0.027 | - | 1483 | - | 2073 |
| SKYLIGHT | 293 | 0.240 | 0.448 | 687 | 18568 | 4325 |

| TABLE 20.1.A. Component Loads For Space "3260B SPED-READING" In Zone "20" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 199 ft² | 240 | - | 199 ft² | 329 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 139 W | 408 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 100 W | 318 | - | 0 | 0 | - |
| People | 4 | 749 | 480 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 86 | 24 | 5% | 16 | 0 |
| **>> Total Zone Loads** | **-** | **1801** | **504** | **-** | **345** | **0** |

| TABLE 20.1.B. Envelope Loads For Space "3260B SPED-READING" In Zone "20" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 199 | 0.027 | - | 240 | - | 329 |

| TABLE 21.1.A. Component Loads For Space "3260A SPED-READING" In Zone "21" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 135 ft² | 151 | - | 135 ft² | 223 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 95 W | 280 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 68 W | 217 | - | 0 | 0 | - |
| People | 4 | 760 | 480 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 70 | 24 | 5% | 11 | 0 |
| **>> Total Zone Loads** | **-** | **1479** | **504** | **-** | **234** | **0** |

| TABLE 21.1.B. Envelope Loads For Space "3260A SPED-READING" In Zone "21" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 135 | 0.027 | - | 151 | - | 223 |

| TABLE 22.1.A. Component Loads For Space "3260C SPED-RESOURCE" In Zone "22" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 93 ft² | 1651 | - | 93 ft² | - | - |
| Wall Transmission | 327 ft² | 362 | - | 327 ft² | 1253 | - |
| Roof Transmission | 502 ft² | 606 | - | 502 ft² | 830 | - |
| Window Transmission | 93 ft² | 469 | - | 93 ft² | 2173 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 351 W | 1030 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 251 W | 802 | - | 0 | 0 | - |
| People | 16 | 2997 | 1920 | 0 | 0 | 0 |
| Infiltration | - | 290 | 286 | - | 1115 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 410 | 110 | 5% | 269 | 0 |
| **>> Total Zone Loads** | **-** | **8617** | **2316** | **-** | **5640** | **0** |

| TABLE 22.1.B. Envelope Loads For Space "3260C SPED-RESOURCE" In Zone "22" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 327 | 0.062 | - | 362 | - | 1253 |
| WINDOW 1 | 93 | 0.380 | 0.437 | 469 | 1651 | 2173 |
| **H EXPOSURE** | | | | | | |
| ROOF | 502 | 0.027 | - | 606 | - | 830 |

| TABLE 23.1.A. Component Loads For Space "3262 CLASSROOM-TP" In Zone "23" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 96 ft² | 107 | - | 96 ft² | 159 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 67 W | 199 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 48 W | 154 | - | 0 | 0 | - |
| People | 2 | 405 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 43 | 21 | 5% | 8 | 0 |
| **>> Total Zone Loads** | **-** | **909** | **431** | **-** | **167** | **0** |

| TABLE 23.1.B. Envelope Loads For Space "3262 CLASSROOM-TP" In Zone "23" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 96 | 0.027 | - | 107 | - | 159 |

| TABLE 24.1.A. Component Loads For Space "3265 OFFICE-DEPT" In Zone "24" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 134 ft² | 150 | - | 134 ft² | 222 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 94 W | 278 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 201 W | 645 | - | 0 | 0 | - |
| People | 4 | 810 | 820 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 94 | 41 | 5% | 11 | 0 |
| **>> Total Zone Loads** | **-** | **1977** | **861** | **-** | **233** | **0** |

| TABLE 24.1.B. Envelope Loads For Space "3265 OFFICE-DEPT" In Zone "24" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 134 | 0.027 | - | 150 | - | 222 |

| TABLE 25.1.A. Component Loads For Space "3266 OFFICE-DEPT" In Zone "25" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 54 ft² | 959 | - | 54 ft² | - | - |
| Wall Transmission | 236 ft² | 240 | - | 236 ft² | 904 | - |
| Roof Transmission | 153 ft² | 185 | - | 153 ft² | 253 | - |
| Window Transmission | 54 ft² | 272 | - | 54 ft² | 1262 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 107 W | 314 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 230 W | 734 | - | 0 | 0 | - |
| People | 2 | 399 | 410 | 0 | 0 | 0 |
| Infiltration | - | 200 | 199 | - | 770 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 165 | 30 | 5% | 159 | 0 |
| **>> Total Zone Loads** | **-** | **3467** | **639** | **-** | **3348** | **0** |

| TABLE 25.1.B. Envelope Loads For Space "3266 OFFICE-DEPT" In Zone "25" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NW EXPOSURE** | | | | | | |
| WALL | 144 | 0.062 | - | 138 | - | 552 |
| **NE EXPOSURE** | | | | | | |
| WALL | 92 | 0.062 | - | 102 | - | 353 |
| WINDOW 1 | 54 | 0.380 | 0.437 | 272 | 959 | 1262 |
| **H EXPOSURE** | | | | | | |
| ROOF | 153 | 0.027 | - | 185 | - | 253 |

| TABLE 26.1.A. Component Loads For Space "3263B CORRIDOR" In Zone "26" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 225 ft² | 278 | - | 225 ft² | 372 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 158 W | 456 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 37 | 0 | 5% | 19 | 0 |
| **>> Total Zone Loads** | **-** | **771** | **0** | **-** | **391** | **0** |

| TABLE 26.1.B. Envelope Loads For Space "3263B CORRIDOR" In Zone "26" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 225 | 0.027 | - | 278 | - | 372 |

| TABLE 26.2.A. Component Loads For Space "3263A GUIDANCE-STOREROOM" In Zone "26" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 87 ft² | 143 | - | 87 ft² | 333 | - |
| Roof Transmission | 20 ft² | 23 | - | 20 ft² | 33 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 14 W | 41 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 58 | 58 | - | 231 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 13 | 3 | 5% | 30 | 0 |
| **>> Total Zone Loads** | **-** | **279** | **61** | **-** | **627** | **0** |

| TABLE 26.2.B. Envelope Loads For Space "3263A GUIDANCE-STOREROOM" In Zone "26" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SE EXPOSURE** | | | | | | |
| WALL | 87 | 0.062 | - | 143 | - | 333 |
| **H EXPOSURE** | | | | | | |
| ROOF | 20 | 0.027 | - | 23 | - | 33 |

| TABLE 26.3.A. Component Loads For Space "3263 GUIDANCE-WAITING" In Zone "26" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 76 ft² | 74 | - | 76 ft² | 126 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 53 W | 159 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 114 W | 368 | - | 0 | 0 | - |
| People | 4 | 771 | 480 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 69 | 24 | 5% | 6 | 0 |
| **>> Total Zone Loads** | **-** | **1441** | **504** | **-** | **132** | **0** |

| TABLE 26.3.B. Envelope Loads For Space "3263 GUIDANCE-WAITING" In Zone "26" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 76 | 0.027 | - | 74 | - | 126 |

| TABLE 27.1.A. Component Loads For Space "3267 GUIDANCE-OFFICE" In Zone "27" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 80 ft² | 1475 | - | 80 ft² | - | - |
| Wall Transmission | 72 ft² | 78 | - | 72 ft² | 276 | - |
| Roof Transmission | 159 ft² | 196 | - | 159 ft² | 263 | - |
| Window Transmission | 80 ft² | 388 | - | 80 ft² | 1870 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 111 W | 322 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 239 W | 759 | - | 0 | 0 | - |
| People | 2 | 393 | 410 | 0 | 0 | 0 |
| Infiltration | - | 102 | 104 | - | 403 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 186 | 26 | 5% | 141 | 0 |
| **>> Total Zone Loads** | **-** | **3899** | **539** | **-** | **2952** | **0** |

| TABLE 27.1.B. Envelope Loads For Space "3267 GUIDANCE-OFFICE" In Zone "27" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 72 | 0.062 | - | 78 | - | 276 |
| WINDOW 1 | 80 | 0.380 | 0.437 | 388 | 1475 | 1870 |
| **H EXPOSURE** | | | | | | |
| ROOF | 159 | 0.027 | - | 196 | - | 263 |

| TABLE 28.1.A. Component Loads For Space "3268 GUIDANCE-OFFICE" In Zone "28" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 65 ft² | 1198 | - | 65 ft² | - | - |
| Wall Transmission | 292 ft² | 415 | - | 292 ft² | 1119 | - |
| Roof Transmission | 154 ft² | 190 | - | 154 ft² | 255 | - |
| Window Transmission | 65 ft² | 315 | - | 65 ft² | 1519 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 108 W | 312 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 231 W | 735 | - | 0 | 0 | - |
| People | 2 | 393 | 410 | 0 | 0 | 0 |
| Infiltration | - | 239 | 244 | - | 947 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 190 | 33 | 5% | 192 | 0 |
| **>> Total Zone Loads** | **-** | **3988** | **687** | **-** | **4032** | **0** |

| TABLE 28.1.B. Envelope Loads For Space "3268 GUIDANCE-OFFICE" In Zone "28" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NE EXPOSURE** | | | | | | |
| WALL | 72 | 0.062 | - | 78 | - | 276 |
| WINDOW 1 | 65 | 0.380 | 0.437 | 315 | 1198 | 1519 |
| **SE EXPOSURE** | | | | | | |
| WALL | 220 | 0.062 | - | 337 | - | 843 |
| **H EXPOSURE** | | | | | | |
| ROOF | 154 | 0.027 | - | 190 | - | 255 |

| TABLE 29.1.A. Component Loads For Space "3269 WORKROOM" In Zone "29" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 266 ft² | 422 | - | 266 ft² | 1019 | - |
| Roof Transmission | 196 ft² | 218 | - | 196 ft² | 324 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 137 W | 402 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 294 W | 940 | - | 0 | 0 | - |
| People | 8 | 1596 | 1640 | 0 | 0 | 0 |
| Infiltration | - | 184 | 182 | - | 706 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 188 | 91 | 5% | 102 | 0 |
| **>> Total Zone Loads** | **-** | **3950** | **1913** | **-** | **2152** | **0** |

| TABLE 29.1.B. Envelope Loads For Space "3269 WORKROOM" In Zone "29" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SE EXPOSURE** | | | | | | |
| WALL | 266 | 0.062 | - | 422 | - | 1019 |
| **H EXPOSURE** | | | | | | |
| ROOF | 196 | 0.027 | - | 218 | - | 324 |

| TABLE 30.1.A. Component Loads For Space "1134 MAKER SPACE" In Zone "30" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 366 ft² | 12563 | - | 366 ft² | - | - |
| Wall Transmission | 551 ft² | 761 | - | 551 ft² | 2112 | - |
| Roof Transmission | 793 ft² | 913 | - | 793 ft² | 1311 | - |
| Window Transmission | 366 ft² | 1936 | - | 366 ft² | 9328 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1955 ft² | 0 | - | 1955 ft² | 1908 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1369 W | 3964 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 2000 W | 6364 | - | 0 | 0 | - |
| People | 26 | 5104 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 615 | 625 | - | 2434 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 1611 | 298 | 5% | 855 | 0 |
| **>> Total Zone Loads** | **-** | **33830** | **6253** | **-** | **17947** | **0** |

| TABLE 30.1.B. Envelope Loads For Space "1134 MAKER SPACE" In Zone "30" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **E EXPOSURE** | | | | | | |
| WALL | 287 | 0.062 | - | 396 | - | 1100 |
| WINDOW 2 | 105 | 0.500 | 1.000 | 670 | 5696 | 3229 |
| **SSW EXPOSURE** | | | | | | |
| WALL | 264 | 0.062 | - | 365 | - | 1012 |
| WINDOW 1 | 261 | 0.380 | 0.333 | 1266 | 6867 | 6100 |
| **H EXPOSURE** | | | | | | |
| ROOF | 793 | 0.027 | - | 913 | - | 1311 |

| TABLE 31.1.A. Component Loads For Space "1048 BREAKOUT" In Zone "31" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 310 ft² | 0 | - | 310 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 217 W | 671 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 155 W | 507 | - | 0 | 0 | - |
| People | 8 | 1718 | 1640 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 145 | 82 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **3040** | **1722** | **-** | **0** | **0** |

| TABLE 31.1.B. Envelope Loads For Space "1048 BREAKOUT" In Zone "31" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 32.1.A. Component Loads For Space "1132 CLASSROOM-TP" In Zone "32" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 98 ft² | 0 | - | 98 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 49 W | 160 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 40 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **842** | **431** | **-** | **0** | **0** |

| TABLE 32.1.B. Envelope Loads For Space "1132 CLASSROOM-TP" In Zone "32" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 33.1.A. Component Loads For Space "1000B CORRIDOR (E)" In Zone "33" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 181 ft² | 2395 | - | 181 ft² | - | - |
| Wall Transmission | 358 ft² | 345 | - | 358 ft² | 1372 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 181 ft² | 912 | - | 181 ft² | 4230 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1879 ft² | 0 | - | 1879 ft² | 1716 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1315 W | 3854 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 372 | 348 | - | 1430 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 394 | 17 | 5% | 437 | 0 |
| **>> Total Zone Loads** | **-** | **8272** | **365** | **-** | **9186** | **0** |

| TABLE 33.1.B. Envelope Loads For Space "1000B CORRIDOR (E)" In Zone "33" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NNE EXPOSURE** | | | | | | |
| WALL | 358 | 0.062 | - | 345 | - | 1372 |
| WINDOW 1 | 181 | 0.380 | 0.437 | 912 | 2395 | 4230 |

**TABLE 34.1.A. Component Loads For Space "1130 CLASSROOM-ELL" In Zone "34"**

| | DESIGN COOLING | | | DESIGN HEATING | | |
|---|---|---|---|---|---|---|
| | COOLING DATA AT Sep 1400<br>COOLING OA DB / WB 86.0 °F / 70.4 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 144 ft² | 4502 | - | 144 ft² | - | - |
| Wall Transmission | 262 ft² | 364 | - | 262 ft² | 1004 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 144 ft² | 452 | - | 144 ft² | 3365 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 867 ft² | 0 | - | 867 ft² | 902 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 607 W | 1758 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 434 W | 1379 | - | 0 | 0 | - |
| People | 26 | 5104 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 193 | 196 | - | 1077 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 688 | 276 | 5% | 317 | 0 |
| **>> Total Zone Loads** | **-** | **14441** | **5803** | **-** | **6667** | **0** |

**TABLE 34.1.B. Envelope Loads For Space "1130 CLASSROOM-ELL" In Zone "34"**

| | | | | COOLING | COOLING | HEATING |
|---|---|---|---|---|---|---|
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 185 | 0.062 | - | 291 | - | 709 |
| WINDOW 1 | 144 | 0.380 | 0.333 | 452 | 4502 | 3365 |
| **WSW EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 47 | - | 215 |
| **ESE EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 26 | - | 80 |

| TABLE 35.1.A. Component Loads For Space "1038 BREAKOUT" In Zone "35" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 341 ft² | 0 | - | 341 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 239 W | 738 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 171 W | 557 | - | 0 | 0 | - |
| People | 8 | 1718 | 1640 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 151 | 82 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **3164** | **1722** | **-** | **0** | **0** |

| TABLE 35.1.B. Envelope Loads For Space "1038 BREAKOUT" In Zone "35" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 36.1.A. Component Loads For Space "1128B SPED-READING" In Zone "36" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 199 ft² | 0 | - | 199 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 139 W | 431 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 100 W | 325 | - | 0 | 0 | - |
| People | 4 | 806 | 480 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 78 | 24 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1640** | **504** | **-** | **0** | **0** |

| TABLE 36.1.B. Envelope Loads For Space "1128B SPED-READING" In Zone "36" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 37.1.A. Component Loads For Space "1128A SPED-READING" In Zone "37" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 137 ft² | 0 | - | 137 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 96 W | 296 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 69 W | 224 | - | 0 | 0 | - |
| People | 4 | 806 | 480 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 66 | 24 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1393** | **504** | **-** | **0** | **0** |

| TABLE 37.1.B. Envelope Loads For Space "1128A SPED-READING" In Zone "37" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 38.1.A. Component Loads For Space "1128C SPED-RESOURCE" In Zone "38" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 93 ft² | 3005 | - | 93 ft² | - | - |
| Wall Transmission | 327 ft² | 532 | - | 327 ft² | 1253 | - |
| Roof Transmission | 7 ft² | 6 | - | 7 ft² | 12 | - |
| Window Transmission | 93 ft² | 310 | - | 93 ft² | 2173 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 503 ft² | 0 | - | 503 ft² | 654 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 352 W | 1032 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 252 W | 804 | - | 0 | 0 | - |
| People | 16 | 2997 | 1920 | 0 | 0 | 0 |
| Infiltration | - | 208 | 208 | - | 1115 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 445 | 106 | 5% | 260 | 0 |
| **>> Total Zone Loads** | **-** | **9337** | **2235** | **-** | **5467** | **0** |

| TABLE 38.1.B. Envelope Loads For Space "1128C SPED-RESOURCE" In Zone "38" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SSW EXPOSURE** | | | | | | |
| WALL | 327 | 0.062 | - | 532 | - | 1253 |
| WINDOW 1 | 93 | 0.380 | 0.333 | 310 | 3005 | 2173 |
| **H EXPOSURE** | | | | | | |
| ROOF | 7 | 0.027 | - | 6 | - | 12 |

| TABLE 39.1.A. Component Loads For Space "1122 CLASSROOM-TP" In Zone "39" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 96 ft² | 0 | - | 96 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 67 W | 208 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 48 W | 157 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 40 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **834** | **431** | **-** | **0** | **0** |

| TABLE 39.1.B. Envelope Loads For Space "1122 CLASSROOM-TP" In Zone "39" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 40.1.A. Component Loads For Space "1009 COHORT COMMON" In Zone "40" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1420 ft² | 0 | - | 1420 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 994 W | 3073 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 710 W | 2321 | - | 0 | 0 | - |
| People | 30 | 6442 | 6150 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 592 | 308 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **12428** | **6458** | **-** | **0** | **0** |

| TABLE 40.1.B. Envelope Loads For Space "1009 COHORT COMMON" In Zone "40" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 41.1.A. Component Loads For Space "1126 GUIDANCE-OFFICE" In Zone "41" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 135 ft² | 0 | - | 135 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 95 W | 292 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 203 W | 662 | - | 0 | 0 | - |
| People | 4 | 859 | 820 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 91 | 41 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1904** | **861** | **-** | **0** | **0** |

| TABLE 41.1.B. Envelope Loads For Space "1126 GUIDANCE-OFFICE" In Zone "41" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 42.1.A. Component Loads For Space "1121B GUIDANCE-WAITING" In Zone "42" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 76 ft² | 0 | - | 76 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 53 W | 164 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 4 | 806 | 480 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 49 | 24 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1019** | **504** | **-** | **0** | **0** |

| TABLE 42.1.B. Envelope Loads For Space "1121B GUIDANCE-WAITING" In Zone "42" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 42.2.A. Component Loads For Space "1121 CORRIDOR" In Zone "42" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 225 ft² | 0 | - | 225 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 158 W | 487 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 24 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **511** | **0** | **-** | **0** | **0** |

| TABLE 42.2.B. Envelope Loads For Space "1121 CORRIDOR" In Zone "42" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 42.3.A. Component Loads For Space "1121A GUIDANCE-STORAGE" In Zone "42" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 19 ft² | 0 | - | 19 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 13 W | 41 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 2 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **43** | **0** | **-** | **0** | **0** |

| TABLE 42.3.B. Envelope Loads For Space "1121A GUIDANCE-STORAGE" In Zone "42" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 43.1.A. Component Loads For Space "1125 GUIDANCE OFFICE" In Zone "43" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1400<br>COOLING OA DB / WB 86.0 °F / 70.4 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 66 ft² | 2064 | - | 66 ft² | - | - |
| Wall Transmission | 211 ft² | 204 | - | 211 ft² | 809 | - |
| Roof Transmission | 108 ft² | 94 | - | 108 ft² | 179 | - |
| Window Transmission | 66 ft² | 207 | - | 66 ft² | 1542 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 157 ft² | 0 | - | 157 ft² | 280 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 110 W | 318 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 236 W | 749 | - | 0 | 0 | - |
| People | 2 | 393 | 410 | 0 | 0 | 0 |
| Infiltration | - | 132 | 138 | - | 735 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 208 | 27 | 5% | 177 | 0 |
| **>> Total Zone Loads** | **-** | **4369** | **575** | **-** | **3723** | **0** |

| TABLE 43.1.B. Envelope Loads For Space "1125 GUIDANCE OFFICE" In Zone "43" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **W EXPOSURE** | | | | | | |
| WALL | 133 | 0.062 | - | 81 | - | 510 |
| **S EXPOSURE** | | | | | | |
| WALL | 78 | 0.062 | - | 123 | - | 299 |
| WINDOW 1 | 66 | 0.380 | 0.333 | 207 | 2064 | 1542 |
| **H EXPOSURE** | | | | | | |
| ROOF | 108 | 0.027 | - | 94 | - | 179 |

| TABLE 44.1.A. Component Loads For Space "1124 OFFICE-DEPT" In Zone "44" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1300<br>COOLING OA DB / WB 84.8 °F / 70.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 89 ft² | 2884 | - | 89 ft² | - | - |
| Wall Transmission | 55 ft² | 74 | - | 55 ft² | 211 | - |
| Roof Transmission | 96 ft² | 83 | - | 96 ft² | 159 | - |
| Window Transmission | 89 ft² | 246 | - | 89 ft² | 2080 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 159 ft² | 0 | - | 159 ft² | 214 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 111 W | 318 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 239 W | 755 | - | 0 | 0 | - |
| People | 2 | 386 | 410 | 0 | 0 | 0 |
| Infiltration | - | 61 | 71 | - | 382 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 240 | 24 | 5% | 152 | 0 |
| **>> Total Zone Loads** | **-** | **5047** | **506** | **-** | **3198** | **0** |

| TABLE 44.1.B. Envelope Loads For Space "1124 OFFICE-DEPT" In Zone "44" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 55 | 0.062 | - | 74 | - | 211 |
| WINDOW 1 | 89 | 0.380 | 0.333 | 246 | 2884 | 2080 |
| **H EXPOSURE** | | | | | | |
| ROOF | 96 | 0.027 | - | 83 | - | 159 |

| TABLE 45.1.A. Component Loads For Space "1123 OFFICE-DEPT" In Zone "45" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1300<br>COOLING OA DB / WB 84.8 °F / 70.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 65 ft² | 2106 | - | 65 ft² | - | - |
| Wall Transmission | 72 ft² | 97 | - | 72 ft² | 276 | - |
| Roof Transmission | 57 ft² | 49 | - | 57 ft² | 94 | - |
| Window Transmission | 65 ft² | 179 | - | 65 ft² | 1519 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 153 ft² | 0 | - | 153 ft² | 207 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 107 W | 306 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 230 W | 727 | - | 0 | 0 | - |
| People | 2 | 386 | 410 | 0 | 0 | 0 |
| Infiltration | - | 58 | 68 | - | 364 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 195 | 24 | 5% | 123 | 0 |
| **>> Total Zone Loads** | **-** | **4104** | **502** | **-** | **2583** | **0** |

| TABLE 45.1.B. Envelope Loads For Space "1123 OFFICE-DEPT" In Zone "45" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 72 | 0.062 | - | 97 | - | 276 |
| WINDOW 1 | 65 | 0.380 | 0.333 | 179 | 2106 | 1519 |
| **H EXPOSURE** | | | | | | |
| ROOF | 57 | 0.027 | - | 49 | - | 94 |

| TABLE 46.1.A. Component Loads For Space "1120 WORKROOM" In Zone "46" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 194 ft² | 0 | - | 194 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 136 W | 420 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 291 W | 951 | - | 0 | 0 | - |
| People | 8 | 1718 | 1640 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 154 | 82 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **3244** | **1722** | **-** | **0** | **0** |

| TABLE 46.1.B. Envelope Loads For Space "1120 WORKROOM" In Zone "46" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 47.1.A. Component Loads For Space "1114 SCIENCE CLASSROOM" In Zone "47" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1400<br>COOLING OA DB / WB 86.0 °F / 70.4 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 195 ft² | 6097 | - | 195 ft² | - | - |
| Wall Transmission | 253 ft² | 398 | - | 253 ft² | 970 | - |
| Roof Transmission | 265 ft² | 231 | - | 265 ft² | 438 | - |
| Window Transmission | 195 ft² | 612 | - | 195 ft² | 4557 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1136 ft² | 0 | - | 1136 ft² | 1003 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 795 W | 2303 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 568 W | 1807 | - | 0 | 0 | - |
| People | 26 | 5104 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 213 | 216 | - | 1189 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 838 | 277 | 5% | 408 | 0 |
| **>> Total Zone Loads** | **-** | **17604** | **5823** | **-** | **8564** | **0** |

| TABLE 47.1.B. Envelope Loads For Space "1114 SCIENCE CLASSROOM" In Zone "47" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 253 | 0.062 | - | 398 | - | 970 |
| WINDOW 1 | 195 | 0.380 | 0.333 | 612 | 6097 | 4557 |
| **H EXPOSURE** | | | | | | |
| ROOF | 265 | 0.027 | - | 231 | - | 438 |

| TABLE 48.1.A. Component Loads For Space "1112 SCIENCE-TP" In Zone "48" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 98 ft² | 0 | - | 98 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 49 W | 160 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 40 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **842** | **431** | **-** | **0** | **0** |

| TABLE 48.1.B. Envelope Loads For Space "1112 SCIENCE-TP" In Zone "48" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 49.1.A. Component Loads For Space "1111A SCIENCE PREP" In Zone "49" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 81 ft² | 0 | - | 81 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 57 W | 175 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 41 W | 132 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 37 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **774** | **431** | **-** | **0** | **0** |

| TABLE 49.1.B. Envelope Loads For Space "1111A SCIENCE PREP" In Zone "49" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 49.2.A. Component Loads For Space "1111B SCIENCE PREP" In Zone "49" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 80 ft² | 0 | - | 80 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 56 W | 173 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 40 W | 131 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 37 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **770** | **431** | **-** | **0** | **0** |

| TABLE 49.2.B. Envelope Loads For Space "1111B SCIENCE PREP" In Zone "49" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 50.1.A. Component Loads For Space "1110 SCIENCE CLASSROOM" In Zone "50" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1200<br>COOLING OA DB / WB 83.0 °F / 69.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 261 ft² | 8268 | - | 261 ft² | - | - |
| Wall Transmission | 772 ft² | 656 | - | 772 ft² | 2959 | - |
| Roof Transmission | 274 ft² | 216 | - | 274 ft² | 453 | - |
| Window Transmission | 261 ft² | 583 | - | 261 ft² | 6100 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1146 ft² | 0 | - | 1146 ft² | 1558 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 802 W | 2263 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 573 W | 1804 | - | 0 | 0 | - |
| People | 26 | 4920 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 356 | 485 | - | 2742 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 953 | 291 | 5% | 691 | 0 |
| **>> Total Zone Loads** | **-** | **20019** | **6105** | **-** | **14501** | **0** |

| TABLE 50.1.B. Envelope Loads For Space "1110 SCIENCE CLASSROOM" In Zone "50" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SSE EXPOSURE** | | | | | | |
| WALL | 187 | 0.062 | - | 246 | - | 717 |
| WINDOW 1 | 261 | 0.380 | 0.333 | 583 | 8268 | 6100 |
| **ENE EXPOSURE** | | | | | | |
| WALL | 585 | 0.062 | - | 410 | - | 2242 |
| **H EXPOSURE** | | | | | | |
| ROOF | 274 | 0.027 | - | 216 | - | 453 |

| TABLE 51.1.A. Component Loads For Space "2134 CLASSROOM" In Zone "51" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 6138 | - | 190 ft² | - | - |
| Wall Transmission | 329 ft² | 462 | - | 329 ft² | 1261 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 190 ft² | 632 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 610 W | 1789 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 436 W | 1394 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 258 | 257 | - | 1377 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 793 | 279 | 5% | 354 | 0 |
| **>> Total Zone Loads** | **-** | **16653** | **5867** | **-** | **7433** | **0** |

| TABLE 51.1.B. Envelope Loads For Space "2134 CLASSROOM" In Zone "51" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SSW EXPOSURE** | | | | | | |
| WALL | 202 | 0.062 | - | 328 | - | 774 |
| WINDOW 1 | 190 | 0.380 | 0.333 | 632 | 6138 | 4440 |
| **W EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 50 | - | 215 |
| **ESE EXPOSURE** | | | | | | |
| WALL | 71 | 0.062 | - | 83 | - | 272 |

| TABLE 52.1.A. Component Loads For Space "2132 CLASSROOM-TP" In Zone "52" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 49 W | 160 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 40 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **842** | **431** | **-** | **0** | **0** |

| TABLE 52.1.B. Envelope Loads For Space "2132 CLASSROOM-TP" In Zone "52" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 53.1.A. Component Loads For Space "2130 CLASSROOM" In Zone "53" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1400<br>COOLING OA DB / WB 86.0 °F / 70.4 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 5941 | - | 190 ft² | - | - |
| Wall Transmission | 293 ft² | 399 | - | 293 ft² | 1123 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 190 ft² | 597 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 612 W | 1772 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 437 W | 1391 | - | 0 | 0 | - |
| People | 26 | 5104 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 230 | 236 | - | 1282 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 772 | 278 | 5% | 342 | 0 |
| **>> Total Zone Loads** | **-** | **16205** | **5845** | **-** | **7187** | **0** |

| TABLE 53.1.B. Envelope Loads For Space "2130 CLASSROOM" In Zone "53" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 202 | 0.062 | - | 318 | - | 774 |
| WINDOW 1 | 190 | 0.380 | 0.333 | 597 | 5941 | 4440 |
| **WSW EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 47 | - | 215 |
| **ESE EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 26 | - | 80 |
| **W EXPOSURE** | | | | | | |
| WALL | 14 | 0.062 | - | 9 | - | 54 |

| TABLE 54.1.A. Component Loads For Space "2038 BREAKOUT" In Zone "54" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 262 W | 809 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 187 W | 611 | - | 0 | 0 | - |
| People | 8 | 1718 | 1640 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 157 | 82 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **3296** | **1722** | **-** | **0** | **0** |

| TABLE 54.1.B. Envelope Loads For Space "2038 BREAKOUT" In Zone "54" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 55.1.A. Component Loads For Space "2124 SPED-CLASSROOM" In Zone "55" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 6138 | - | 190 ft² | - | - |
| Wall Transmission | 329 ft² | 477 | - | 329 ft² | 1261 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 190 ft² | 632 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 36 ft² | 31 | - | 36 ft² | 218 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 611 W | 1791 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 437 W | 1396 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 258 | 258 | - | 1377 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 796 | 279 | 5% | 365 | 0 |
| **>> Total Zone Loads** | **-** | **16706** | **5867** | **-** | **7662** | **0** |

| TABLE 55.1.B. Envelope Loads For Space "2124 SPED-CLASSROOM" In Zone "55" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SSW EXPOSURE** | | | | | | |
| WALL | 202 | 0.062 | - | 328 | - | 774 |
| WINDOW 1 | 190 | 0.380 | 0.333 | 632 | 6138 | 4440 |
| **WSW EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 66 | - | 215 |
| **ESE EXPOSURE** | | | | | | |
| WALL | 71 | 0.062 | - | 83 | - | 272 |

| TABLE 56.1.A. Component Loads For Space "2122 SPED-TP" In Zone "56" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 49 W | 160 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 40 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **842** | **431** | **-** | **0** | **0** |

| TABLE 56.1.B. Envelope Loads For Space "2122 SPED-TP" In Zone "56" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 57.1.A. Component Loads For Space "2000B CORRIDOR (E)" In Zone "57" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 180 ft² | 2057 | - | 180 ft² | - | - |
| Wall Transmission | 318 ft² | 321 | - | 318 ft² | 1219 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 180 ft² | 859 | - | 180 ft² | 4207 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1145 W | 3426 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 311 | 336 | - | 1322 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 349 | 17 | 5% | 337 | 0 |
| **>> Total Zone Loads** | **-** | **7323** | **353** | **-** | **7084** | **0** |

| TABLE 57.1.B. Envelope Loads For Space "2000B CORRIDOR (E)" In Zone "57" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **N EXPOSURE** | | | | | | |
| WALL | 318 | 0.062 | - | 321 | - | 1219 |
| WINDOW 1 | 180 | 0.380 | 0.437 | 859 | 2057 | 4207 |

| TABLE 58.1.A. Component Loads For Space "2120 SPED-CLASSROOM" In Zone "58" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1400<br>COOLING OA DB / WB 86.0 °F / 70.4 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 5941 | - | 190 ft² | - | - |
| Wall Transmission | 293 ft² | 393 | - | 293 ft² | 1123 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 190 ft² | 597 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 612 W | 1772 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 437 W | 1391 | - | 0 | 0 | - |
| People | 26 | 5104 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 230 | 236 | - | 1282 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 771 | 278 | 5% | 342 | 0 |
| **>> Total Zone Loads** | **-** | **16198** | **5845** | **-** | **7187** | **0** |

| TABLE 58.1.B. Envelope Loads For Space "2120 SPED-CLASSROOM" In Zone "58" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 202 | 0.062 | - | 318 | - | 774 |
| WINDOW 1 | 190 | 0.380 | 0.333 | 597 | 5941 | 4440 |
| **E EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 20 | - | 80 |
| **WSW EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 47 | - | 215 |
| **W EXPOSURE** | | | | | | |
| WALL | 14 | 0.062 | - | 9 | - | 54 |

| TABLE 59.1.A. Component Loads For Space "2114 CLASSROOM" In Zone "59" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1400<br>COOLING OA DB / WB 86.0 °F / 70.4 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 5941 | - | 190 ft² | - | - |
| Wall Transmission | 329 ft² | 433 | - | 329 ft² | 1261 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 190 ft² | 597 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 600 W | 1738 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 429 W | 1363 | - | 0 | 0 | - |
| People | 26 | 5104 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 247 | 254 | - | 1377 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 771 | 279 | 5% | 354 | 0 |
| **>> Total Zone Loads** | **-** | **16194** | **5864** | **-** | **7433** | **0** |

| TABLE 59.1.B. Envelope Loads For Space "2114 CLASSROOM" In Zone "59" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 202 | 0.062 | - | 318 | - | 774 |
| WINDOW 1 | 190 | 0.380 | 0.333 | 597 | 5941 | 4440 |
| **E EXPOSURE** | | | | | | |
| WALL | 71 | 0.062 | - | 68 | - | 272 |
| **WSW EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 47 | - | 215 |

| TABLE 60.1.A. Component Loads For Space "2112 CLASSROOM-TP" In Zone "60" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 69 W | 212 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 49 W | 160 | - | 0 | 0 | - |
| People | 2 | 429 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 40 | 21 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **842** | **431** | **-** | **0** | **0** |

| TABLE 60.1.B. Envelope Loads For Space "2112 CLASSROOM-TP" In Zone "60" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 61.1.A. Component Loads For Space "2110 CLASSROOM-ELL" In Zone "61" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1200<br>COOLING OA DB / WB 83.0 °F / 69.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 190 ft² | 6019 | - | 190 ft² | - | - |
| Wall Transmission | 731 ft² | 770 | - | 731 ft² | 2802 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 190 ft² | 424 | - | 190 ft² | 4440 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 612 W | 1726 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 437 W | 1376 | - | 0 | 0 | - |
| People | 26 | 4920 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 317 | 434 | - | 2444 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 778 | 288 | 5% | 484 | 0 |
| **>> Total Zone Loads** | **-** | **16329** | **6052** | **-** | **10170** | **0** |

| TABLE 61.1.B. Envelope Loads For Space "2110 CLASSROOM-ELL" In Zone "61" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SSE EXPOSURE** | | | | | | |
| WALL | 202 | 0.062 | - | 266 | - | 774 |
| WINDOW 1 | 190 | 0.380 | 0.333 | 424 | 6019 | 4440 |
| **SW EXPOSURE** | | | | | | |
| WALL | 56 | 0.062 | - | 27 | - | 215 |
| **WSW EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 7 | - | 80 |
| **E EXPOSURE** | | | | | | |
| WALL | 452 | 0.062 | - | 470 | - | 1732 |

| TABLE 62.1.A. Component Loads For Space "3134 CLASSROOM" In Zone "62" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 185 ft² | 5977 | - | 185 ft² | - | - |
| Wall Transmission | 364 ft² | 504 | - | 364 ft² | 1395 | - |
| Roof Transmission | 884 ft² | 724 | - | 884 ft² | 1461 | - |
| Window Transmission | 185 ft² | 616 | - | 185 ft² | 4323 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 619 W | 1813 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 442 W | 1413 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 272 | 273 | - | 1457 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 825 | 280 | 5% | 432 | 0 |
| **>> Total Zone Loads** | **-** | **17332** | **5883** | **-** | **9069** | **0** |

| TABLE 62.1.B. Envelope Loads For Space "3134 CLASSROOM" In Zone "62" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SSW EXPOSURE** | | | | | | |
| WALL | 210 | 0.062 | - | 342 | - | 805 |
| WINDOW 1 | 185 | 0.380 | 0.333 | 616 | 5977 | 4323 |
| **W EXPOSURE** | | | | | | |
| WALL | 63 | 0.062 | - | 57 | - | 241 |
| **ESE EXPOSURE** | | | | | | |
| WALL | 91 | 0.062 | - | 106 | - | 349 |
| **H EXPOSURE** | | | | | | |
| ROOF | 884 | 0.027 | - | 724 | - | 1461 |

| TABLE 63.1.A. Component Loads For Space "3132 CLASSROOM-TP" In Zone "63" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 95 ft² | 106 | - | 95 ft² | 157 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 67 W | 197 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 48 W | 153 | - | 0 | 0 | - |
| People | 2 | 405 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 43 | 21 | 5% | 8 | 0 |
| **>> Total Zone Loads** | **-** | **904** | **431** | **-** | **165** | **0** |

| TABLE 63.1.B. Envelope Loads For Space "3132 CLASSROOM-TP" In Zone "63" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 95 | 0.027 | - | 106 | - | 157 |

| TABLE 64.1.A. Component Loads For Space "3130 CLASSROOM" In Zone "64" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1400<br>COOLING OA DB / WB 86.0 °F / 70.4 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 144 ft² | 4502 | - | 144 ft² | - | - |
| Wall Transmission | 367 ft² | 485 | - | 367 ft² | 1407 | - |
| Roof Transmission | 886 ft² | 772 | - | 886 ft² | 1465 | - |
| Window Transmission | 144 ft² | 452 | - | 144 ft² | 3365 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 620 W | 1796 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 443 W | 1410 | - | 0 | 0 | - |
| People | 26 | 5104 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 243 | 250 | - | 1356 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 738 | 279 | 5% | 380 | 0 |
| **>> Total Zone Loads** | **-** | **15503** | **5859** | **-** | **7972** | **0** |

| TABLE 64.1.B. Envelope Loads For Space "3130 CLASSROOM" In Zone "64" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 248 | 0.062 | - | 390 | - | 950 |
| WINDOW 1 | 144 | 0.380 | 0.333 | 452 | 4502 | 3365 |
| **WSW EXPOSURE** | | | | | | |
| WALL | 98 | 0.062 | - | 82 | - | 376 |
| **W EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 13 | - | 80 |
| **H EXPOSURE** | | | | | | |
| ROOF | 886 | 0.027 | - | 772 | - | 1465 |

| TABLE 65.1.A. Component Loads For Space "3124 SCIENCE-CLASSROOM" In Zone "65" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1500<br>COOLING OA DB / WB 86.5 °F / 70.5 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 172 ft² | 5557 | - | 172 ft² | - | - |
| Wall Transmission | 354 ft² | 517 | - | 354 ft² | 1357 | - |
| Roof Transmission | 1138 ft² | 932 | - | 1138 ft² | 1881 | - |
| Window Transmission | 172 ft² | 573 | - | 172 ft² | 4020 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 797 W | 2334 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 569 W | 1819 | - | 0 | 0 | - |
| People | 26 | 5187 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 261 | 260 | - | 1396 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 859 | 279 | 5% | 433 | 0 |
| **>> Total Zone Loads** | **-** | **18039** | **5869** | **-** | **9086** | **0** |

| TABLE 65.1.B. Envelope Loads For Space "3124 SCIENCE-CLASSROOM" In Zone "65" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SSW EXPOSURE** | | | | | | |
| WALL | 273 | 0.062 | - | 444 | - | 1046 |
| WINDOW 1 | 172 | 0.380 | 0.333 | 573 | 5557 | 4020 |
| **W EXPOSURE** | | | | | | |
| WALL | 81 | 0.062 | - | 73 | - | 310 |
| **H EXPOSURE** | | | | | | |
| ROOF | 1138 | 0.027 | - | 932 | - | 1881 |

| TABLE 66.1.A. Component Loads For Space "3000B CORRIDOR (E)" In Zone "66" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jun 1400<br>COOLING OA DB / WB 87.5 °F / 70.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 425 ft² | 20079 | - | 425 ft² | - | - |
| Wall Transmission | 404 ft² | 251 | - | 404 ft² | 1548 | - |
| Roof Transmission | 1436 ft² | 1698 | - | 1436 ft² | 2374 | - |
| Window Transmission | 132 ft² | 490 | - | 132 ft² | 3085 | - |
| Skylight Transmission | 293 ft² | 687 | - | 293 ft² | 4325 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1031 W | 2986 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 290 | 258 | - | 1423 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 1324 | 13 | 5% | 638 | 0 |
| **>> Total Zone Loads** | **-** | **27805** | **271** | **-** | **13392** | **0** |

| TABLE 66.1.B. Envelope Loads For Space "3000B CORRIDOR (E)" In Zone "66" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **N EXPOSURE** | | | | | | |
| WALL | 404 | 0.062 | - | 251 | - | 1548 |
| WINDOW 1 | 132 | 0.380 | 0.437 | 490 | 1511 | 3085 |
| **H EXPOSURE** | | | | | | |
| ROOF | 1436 | 0.027 | - | 1698 | - | 2374 |
| SKYLIGHT | 293 | 0.240 | 0.448 | 687 | 18568 | 4325 |

| TABLE 66.2.A. Component Loads For Space "3050 COHORT COMMON" In Zone "66" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 1638 ft² | 1772 | - | 1638 ft² | 2707 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1179 W | 3491 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 842 W | 2704 | - | 0 | 0 | - |
| People | 35 | 7088 | 7175 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 753 | 359 | 5% | 135 | 0 |
| **>> Total Zone Loads** | **-** | **15808** | **7534** | **-** | **2843** | **0** |

| TABLE 66.2.B. Envelope Loads For Space "3050 COHORT COMMON" In Zone "66" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 1488 | 0.027 | - | 1666 | - | 2459 |
| **E EXPOSURE** | | | | | | |
| ROOF | 150 | 0.027 | - | 107 | - | 248 |

| TABLE 67.1.A. Component Loads For Space "3122 SCIENCE-TP" In Zone "67" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 96 ft² | 107 | - | 96 ft² | 159 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 67 W | 199 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 48 W | 154 | - | 0 | 0 | - |
| People | 2 | 405 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 43 | 21 | 5% | 8 | 0 |
| **>> Total Zone Loads** | **-** | **909** | **431** | **-** | **167** | **0** |

| TABLE 67.1.B. Envelope Loads For Space "3122 SCIENCE-TP" In Zone "67" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 96 | 0.027 | - | 107 | - | 159 |

| TABLE 68.1.A. Component Loads For Space "3121B SCIENCE-PREP" In Zone "68" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 79 ft² | 88 | - | 79 ft² | 131 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 55 W | 164 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 40 W | 127 | - | 0 | 0 | - |
| People | 2 | 405 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 39 | 21 | 5% | 7 | 0 |
| **>> Total Zone Loads** | **-** | **823** | **431** | **-** | **137** | **0** |

| TABLE 68.1.B. Envelope Loads For Space "3121B SCIENCE-PREP" In Zone "68" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 79 | 0.027 | - | 88 | - | 131 |

| TABLE 68.2.A. Component Loads For Space "3121A SCIENCE-PREP" In Zone "68" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 82 ft² | 92 | - | 82 ft² | 136 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 57 W | 170 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 41 W | 132 | - | 0 | 0 | - |
| People | 2 | 405 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 40 | 21 | 5% | 7 | 0 |
| **>> Total Zone Loads** | **-** | **838** | **431** | **-** | **142** | **0** |

| TABLE 68.2.B. Envelope Loads For Space "3121A SCIENCE-PREP" In Zone "68" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 82 | 0.027 | - | 92 | - | 136 |

| TABLE 69.1.A. Component Loads For Space "3120 SCIENCE-CLASSROOM" In Zone "69" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1400<br>COOLING OA DB / WB 86.0 °F / 70.4 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 182 ft² | 5690 | - | 182 ft² | - | - |
| Wall Transmission | 397 ft² | 543 | - | 397 ft² | 1522 | - |
| Roof Transmission | 1136 ft² | 990 | - | 1136 ft² | 1878 | - |
| Window Transmission | 182 ft² | 572 | - | 182 ft² | 4253 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 323 ft² | 267 | - | 323 ft² | 1987 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 795 W | 2303 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 568 W | 1807 | - | 0 | 0 | - |
| People | 26 | 5104 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 276 | 282 | - | 1537 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 878 | 281 | 5% | 559 | 0 |
| **>> Total Zone Loads** | **-** | **18431** | **5893** | **-** | **11735** | **0** |

| TABLE 69.1.B. Envelope Loads For Space "3120 SCIENCE-CLASSROOM" In Zone "69" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 264 | 0.062 | - | 415 | - | 1012 |
| WINDOW 1 | 182 | 0.380 | 0.333 | 572 | 5690 | 4253 |
| **E EXPOSURE** | | | | | | |
| WALL | 133 | 0.062 | - | 128 | - | 510 |
| **H EXPOSURE** | | | | | | |
| ROOF | 1136 | 0.027 | - | 990 | - | 1878 |

| TABLE 70.1.A. Component Loads For Space "3114 CLASSROOM" In Zone "70" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1400<br>COOLING OA DB / WB 86.0 °F / 70.4 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 182 ft² | 5690 | - | 182 ft² | - | - |
| Wall Transmission | 403 ft² | 482 | - | 403 ft² | 1545 | - |
| Roof Transmission | 876 ft² | 763 | - | 876 ft² | 1448 | - |
| Window Transmission | 182 ft² | 572 | - | 182 ft² | 4253 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 613 W | 1776 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 438 W | 1394 | - | 0 | 0 | - |
| People | 26 | 5104 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 279 | 288 | - | 1553 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 803 | 281 | 5% | 440 | 0 |
| **>> Total Zone Loads** | **-** | **16863** | **5899** | **-** | **9238** | **0** |

| TABLE 70.1.B. Envelope Loads For Space "3114 CLASSROOM" In Zone "70" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 210 | 0.062 | - | 330 | - | 805 |
| WINDOW 1 | 182 | 0.380 | 0.333 | 572 | 5690 | 4253 |
| **W EXPOSURE** | | | | | | |
| WALL | 98 | 0.062 | - | 60 | - | 376 |
| **E EXPOSURE** | | | | | | |
| WALL | 95 | 0.062 | - | 92 | - | 364 |
| **H EXPOSURE** | | | | | | |
| ROOF | 876 | 0.027 | - | 763 | - | 1448 |

| TABLE 71.1.A. Component Loads For Space "3112 CLASSROOM-TP" In Zone "71" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 96 ft² | 107 | - | 96 ft² | 159 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 67 W | 199 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 48 W | 154 | - | 0 | 0 | - |
| People | 2 | 405 | 410 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 43 | 21 | 5% | 8 | 0 |
| **>> Total Zone Loads** | **-** | **909** | **431** | **-** | **167** | **0** |

| TABLE 71.1.B. Envelope Loads For Space "3112 CLASSROOM-TP" In Zone "71" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **H EXPOSURE** | | | | | | |
| ROOF | 96 | 0.027 | - | 107 | - | 159 |

| TABLE 72.1.A. Component Loads For Space "3110 CLASSROOM" In Zone "72" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Sep 1300<br>COOLING OA DB / WB 84.8 °F / 70.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 158 ft² | 4658 | - | 158 ft² | - | - |
| Wall Transmission | 836 ft² | 927 | - | 836 ft² | 3204 | - |
| Roof Transmission | 874 ft² | 752 | - | 874 ft² | 1445 | - |
| Window Transmission | 158 ft² | 436 | - | 158 ft² | 3692 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 612 W | 1750 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 437 W | 1383 | - | 0 | 0 | - |
| People | 26 | 5015 | 5330 | 0 | 0 | 0 |
| Infiltration | - | 421 | 479 | - | 2638 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 767 | 290 | 5% | 549 | 0 |
| **>> Total Zone Loads** | **-** | **16110** | **6100** | **-** | **11528** | **0** |

| TABLE 72.1.B. Envelope Loads For Space "3110 CLASSROOM" In Zone "72" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **SSE EXPOSURE** | | | | | | |
| WALL | 234 | 0.062 | - | 353 | - | 897 |
| WINDOW 1 | 158 | 0.380 | 0.333 | 436 | 4658 | 3692 |
| **WSW EXPOSURE** | | | | | | |
| WALL | 21 | 0.062 | - | 11 | - | 80 |
| **SW EXPOSURE** | | | | | | |
| WALL | 98 | 0.062 | - | 75 | - | 376 |
| **E EXPOSURE** | | | | | | |
| WALL | 483 | 0.062 | - | 487 | - | 1851 |
| **H EXPOSURE** | | | | | | |
| ROOF | 874 | 0.027 | - | 752 | - | 1445 |

# Space Design Load Summary for RTU-5

Project Name: FULLER SCHOOL 10/03/2019
Prepared by: Garcia Galuska DeSousa consulting engineers 03:34PM

| TABLE 1.1.A. Component Loads For Space "1320 GYM" In Zone "Gymnasium" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 2200<br>COOLING OA DB / WB 80.6 °F / 70.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 253 ft² | 2818 | - | 253 ft² | - | - |
| Wall Transmission | 2790 ft² | 3280 | - | 2790 ft² | 10694 | - |
| Roof Transmission | 2912 ft² | 886 | - | 2912 ft² | 4814 | - |
| Window Transmission | 253 ft² | 644 | - | 253 ft² | 5913 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 2912 ft² | 0 | - | 2912 ft² | 4049 | - |
| Partitions | 1589 ft² | 0 | - | 1589 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 2038 W | 6483 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 728 W | 2409 | - | 0 | 0 | - |
| People | 725 | 155692 | 148625 | 0 | 0 | 0 |
| Infiltration | - | 735 | -1650 | - | 8077 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 8647 | 7349 | 5% | 1677 | 0 |
| **>> Total Zone Loads** | **-** | **181595** | **154324** | **-** | **35224** | **0** |

| TABLE 1.1.B. Envelope Loads For Space "1320 GYM" In Zone "Gymnasium" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **N EXPOSURE** | | | | | | |
| WALL | 1125 | 0.062 | - | 1015 | - | 4313 |
| WINDOW 1 | 101 | 0.380 | 0.437 | 257 | 690 | 2360 |
| **W EXPOSURE** | | | | | | |
| WALL | 1303 | 0.062 | - | 1907 | - | 4992 |
| WINDOW 1 | 101 | 0.380 | 0.333 | 257 | 1680 | 2360 |
| **S EXPOSURE** | | | | | | |
| WALL | 121 | 0.062 | - | 121 | - | 462 |
| WINDOW 1 | 51 | 0.380 | 0.333 | 130 | 449 | 1192 |
| **E EXPOSURE** | | | | | | |
| WALL | 242 | 0.062 | - | 237 | - | 927 |
| **E EXPOSURE** | | | | | | |
| ROOF | 2912 | 0.027 | - | 886 | - | 4814 |

| TABLE 1.2.A. Component Loads For Space "1320B GYM Play Area" In Zone "Gymnasium" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 2200<br>COOLING OA DB / WB 80.6 °F / 70.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 5355 ft² | 1630 | - | 5355 ft² | 8852 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 5355 ft² | 0 | - | 5355 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 3749 W | 11922 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 1339 W | 4430 | - | 0 | 0 | - |
| People | 85 | 52898 | 92650 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 3544 | 4633 | 5% | 443 | 0 |
| **>> Total Zone Loads** | **-** | **74423** | **97283** | **-** | **9295** | **0** |

| TABLE 1.2.B. Envelope Loads For Space "1320B GYM Play Area" In Zone "Gymnasium" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **E EXPOSURE** | | | | | | |
| ROOF | 5355 | 0.027 | - | 1630 | - | 8852 |

| TABLE 1.3.A. Component Loads For Space "1325 GYM STORAGE" In Zone "Gymnasium" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1500<br>COOLING OA DB / WB 91.0 °F / 73.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 51 ft² | 514 | - | 51 ft² | - | - |
| Wall Transmission | 292 ft² | 282 | - | 292 ft² | 1120 | - |
| Roof Transmission | 313 ft² | 371 | - | 313 ft² | 517 | - |
| Window Transmission | 51 ft² | 257 | - | 51 ft² | 1192 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 313 ft² | 0 | - | 313 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 219 W | 642 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 237 | 241 | - | 911 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 115 | 12 | 5% | 187 | 0 |
| **>> Total Zone Loads** | **-** | **2418** | **253** | **-** | **3927** | **0** |

| TABLE 1.3.B. Envelope Loads For Space "1325 GYM STORAGE" In Zone "Gymnasium" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **NNE EXPOSURE** | | | | | | |
| WALL | 292 | 0.062 | - | 282 | - | 1120 |
| WINDOW 1 | 51 | 0.380 | 0.333 | 257 | 514 | 1192 |
| **E EXPOSURE** | | | | | | |
| ROOF | 313 | 0.027 | - | 371 | - | 517 |

# Space Design Load Summary for RTU-6

Project Name: FULLER SCHOOL 10/03/2019
Prepared by: Garcia Galuska DeSousa consulting engineers 03:34PM

| TABLE 1.1.A. Component Loads For Space "1340 AUDITORIUM" In Zone "Auditorium" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1700<br>COOLING OA DB / WB 89.5 °F / 72.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 285 ft² | 3257 | - | 285 ft² | - | - |
| Wall Transmission | 5127 ft² | 6291 | - | 5127 ft² | 19649 | - |
| Roof Transmission | 4414 ft² | 4318 | - | 4414 ft² | 7297 | - |
| Window Transmission | 285 ft² | 1360 | - | 285 ft² | 6660 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 4414 ft² | 0 | - | 4414 ft² | 4252 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 3090 W | 9538 | - | 0 | 0 | - |
| Task Lighting | 4000 W | 12926 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 412 | 78323 | 49440 | 0 | 0 | 0 |
| Infiltration | - | 3379 | 2529 | - | 14363 | -2 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 0% / 0% | 0 | 0 | 0% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **119392** | **51969** | **-** | **52222** | **-2** |

| TABLE 1.1.B. Envelope Loads For Space "1340 AUDITORIUM" In Zone "Auditorium" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **N EXPOSURE** | | | | | | |
| WALL | 2387 | 0.062 | - | 2410 | - | 9148 |
| WINDOW 1 | 285 | 0.380 | 0.437 | 1360 | 3257 | 6660 |
| **E EXPOSURE** | | | | | | |
| WALL | 2260 | 0.062 | - | 3011 | - | 8662 |
| **W EXPOSURE** | | | | | | |
| WALL | 480 | 0.062 | - | 871 | - | 1840 |
| **S EXPOSURE** | | | | | | |
| ROOF | 4414 | 0.027 | - | 4318 | - | 7297 |

| TABLE 1.2.A. Component Loads For Space "1341 STAGE" In Zone "Auditorium" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Aug 2200<br>COOLING OA DB / WB 80.6 °F / 70.0 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 609 ft² | 654 | - | 609 ft² | 2334 | - |
| Roof Transmission | 1560 ft² | 449 | - | 1560 ft² | 2579 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 1560 ft² | 0 | - | 1560 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 1092 W | 3473 | - | 0 | 0 | - |
| Task Lighting | 20000 W | 65669 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 100 | 26734 | 54500 | 0 | 0 | 0 |
| Infiltration | - | 147 | 102 | - | 1616 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 0% / 0% | 0 | 0 | 0% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **97125** | **54602** | **-** | **6529** | **0** |

| TABLE 1.2.B. Envelope Loads For Space "1341 STAGE" In Zone "Auditorium" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| WALL | 609 | 0.062 | - | 654 | - | 2334 |
| **S EXPOSURE** | | | | | | |
| ROOF | 1560 | 0.027 | - | 449 | - | 2579 |

| TABLE 1.3.A. Component Loads For Space "1345 STORAGE" In Zone "Auditorium" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 171 ft² | 212 | - | 171 ft² | 283 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 171 ft² | 0 | - | 171 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 120 W | 347 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 0% / 0% | 0 | 0 | 0% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **558** | **0** | **-** | **283** | **0** |

| TABLE 1.3.B. Envelope Loads For Space "1345 STORAGE" In Zone "Auditorium" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **E EXPOSURE** | | | | | | |
| ROOF | 171 | 0.027 | - | 212 | - | 283 |

| TABLE 2.1.A. Component Loads For Space "1343 DRESSING" In Zone "Zone 2" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 170 ft² | 194 | - | 170 ft² | 281 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 170 ft² | 0 | - | 170 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 119 W | 352 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 255 W | 819 | - | 0 | 0 | - |
| People | 4 | 760 | 480 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 0% / 0% | 0 | 0 | 0% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **2125** | **480** | **-** | **281** | **0** |

| TABLE 2.1.B. Envelope Loads For Space "1343 DRESSING" In Zone "Zone 2" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| ROOF | 170 | 0.027 | - | 194 | - | 281 |

| TABLE 3.1.A. Component Loads For Space "1344 AV" In Zone "Zone 3" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 66 ft² | 75 | - | 66 ft² | 109 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 66 ft² | 0 | - | 66 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 46 W | 137 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 99 W | 322 | - | 0 | 0 | - |
| People | 2 | 375 | 240 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 0% / 0% | 0 | 0 | 0% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **909** | **240** | **-** | **109** | **0** |

| TABLE 3.1.B. Envelope Loads For Space "1344 AV" In Zone "Zone 3" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| ROOF | 66 | 0.027 | - | 75 | - | 109 |

| TABLE 4.1.A. Component Loads For Space "1347 DRESSING" In Zone "Zone 4" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 170 ft² | 194 | - | 170 ft² | 281 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 170 ft² | 0 | - | 170 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 119 W | 352 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 255 W | 819 | - | 0 | 0 | - |
| People | 4 | 760 | 480 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 0% / 0% | 0 | 0 | 0% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **2125** | **480** | **-** | **281** | **0** |

| TABLE 4.1.B. Envelope Loads For Space "1347 DRESSING" In Zone "Zone 4" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| ROOF | 170 | 0.027 | - | 194 | - | 281 |

| TABLE 5.1.A. Component Loads For Space "1348 AV" In Zone "Zone 5" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1600<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 66 ft² | 75 | - | 66 ft² | 109 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 66 ft² | 0 | - | 66 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 60 W | 178 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 129 W | 420 | - | 0 | 0 | - |
| People | 2 | 375 | 240 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 0% / 0% | 0 | 0 | 0% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1048** | **240** | **-** | **109** | **0** |

| TABLE 5.1.B. Envelope Loads For Space "1348 AV" In Zone "Zone 5" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| ROOF | 66 | 0.027 | - | 75 | - | 109 |

| TABLE 6.1.A. Component Loads For Space "1339 VESTIBULE" In Zone "Zone 6" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 171 ft² | 220 | - | 171 ft² | 283 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 171 ft² | 0 | - | 171 ft² | 0 | - |
| Partitions | 155 ft² | 0 | - | 155 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 120 W | 347 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 0% / 0% | 0 | 0 | 0% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **566** | **0** | **-** | **283** | **0** |

| TABLE 6.1.B. Envelope Loads For Space "1339 VESTIBULE" In Zone "Zone 6" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **S EXPOSURE** | | | | | | |
| ROOF | 171 | 0.027 | - | 220 | - | 283 |

| TABLE 7.1.A. Component Loads For Space "1349 VESTIBULE" In Zone "Zone 7" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1400<br>COOLING OA DB / WB 90.5 °F / 72.9 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 392 ft² | 565 | - | 392 ft² | 1502 | - |
| Roof Transmission | 212 ft² | 272 | - | 212 ft² | 350 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 171 ft² | 0 | - | 171 ft² | 486 | - |
| Partitions | 155 ft² | 0 | - | 155 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 148 W | 430 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 263 | 186 | - | 1040 | -1 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 0% / 0% | 0 | 0 | 0% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **1530** | **186** | **-** | **3379** | **-1** |

| TABLE 7.1.B. Envelope Loads For Space "1349 VESTIBULE" In Zone "Zone 7" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **E EXPOSURE** | | | | | | |
| WALL | 392 | 0.062 | - | 565 | - | 1502 |
| **S EXPOSURE** | | | | | | |
| ROOF | 212 | 0.027 | - | 272 | - | 350 |

# Space Design Load Summary for RTU-7

Project Name: FULLER SCHOOL 10/03/2019
Prepared by: Garcia Galuska DeSousa consulting engineers 02:55PM

| TABLE 1.1.A. Component Loads For Space "1324 LOCKER" In Zone "VAV-3-1" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1800<br>COOLING OA DB / WB 87.8 °F / 72.1 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 420 ft² | 849 | - | 420 ft² | 1610 | - |
| Roof Transmission | 76 ft² | 60 | - | 76 ft² | 125 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 418 ft² | 0 | - | 418 ft² | 590 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 293 W | 883 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 232 | 408 | - | 1115 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 101 | 20 | 5% | 172 | 0 |
| **>> Total Zone Loads** | **-** | **2126** | **428** | **-** | **3611** | **0** |

| TABLE 1.1.B. Envelope Loads For Space "1324 LOCKER" In Zone "VAV-3-1" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **W EXPOSURE** | | | | | | |
| WALL | 420 | 0.062 | - | 849 | - | 1610 |
| **H EXPOSURE** | | | | | | |
| ROOF | 76 | 0.027 | - | 60 | - | 125 |

| TABLE 2.1.A. Component Loads For Space "1321 LOCKER" In Zone "VAV-3-2" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 387 ft² | 0 | - | 387 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 271 W | 838 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 42 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **879** | **0** | **-** | **0** | **0** |

| TABLE 2.1.B. Envelope Loads For Space "1321 LOCKER" In Zone "VAV-3-2" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

| TABLE 3.1.A. Component Loads For Space "1210 TOILET (3 STALLS)" In Zone "VAV-3-3" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jul 1800<br>COOLING OA DB / WB 87.8 °F / 72.1 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 238 ft² | 481 | - | 238 ft² | 912 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 196 ft² | 0 | - | 196 ft² | 299 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 137 W | 414 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 131 | 213 | - | 632 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 51 | 11 | 5% | 92 | 0 |
| **>> Total Zone Loads** | **-** | **1078** | **224** | **-** | **1935** | **0** |

| TABLE 3.1.B. Envelope Loads For Space "1210 TOILET (3 STALLS)" In Zone "VAV-3-3" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |
| **W EXPOSURE** | | | | | | |
| WALL | 238 | 0.062 | - | 481 | - | 912 |

| TABLE 4.1.A. Component Loads For Space "1212 TOILET (3 STALLS)" In Zone "VAV-3-4" | | | | | | |
|---|---|---|---|---|---|---|
| | DESIGN COOLING | | | DESIGN HEATING | | |
| | COOLING DATA AT Jan 2100<br>COOLING OA DB / WB 43.1 °F / 42.6 °F<br>OCCUPIED T-STAT 75.0 °F | | | HEATING DATA AT DES HTG<br>HEATING OA DB / WB 8.5 °F / 4.9 °F<br>OCCUPIED T-STAT 70.0 °F | | |
| | | Sensible | Latent | | Sensible | Latent |
| **SPACE LOADS** | **Details** | **(BTU/hr)** | **(BTU/hr)** | **Details** | **(BTU/hr)** | **(BTU/hr)** |
| Window & Skylight Solar Loads | 0 ft² | 0 | - | 0 ft² | - | - |
| Wall Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Roof Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Window Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Skylight Transmission | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Door Loads | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Floor Transmission | 164 ft² | 0 | - | 164 ft² | 0 | - |
| Partitions | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Ceiling | 0 ft² | 0 | - | 0 ft² | 0 | - |
| Overhead Lighting | 115 W | 355 | - | 0 | 0 | - |
| Task Lighting | 0 W | 0 | - | 0 | 0 | - |
| Electric Equipment | 0 W | 0 | - | 0 | 0 | - |
| People | 0 | 0 | 0 | 0 | 0 | 0 |
| Infiltration | - | 0 | 0 | - | 0 | 0 |
| Miscellaneous | - | 0 | 0 | - | 0 | 0 |
| Safety Factor | 5% / 5% | 18 | 0 | 5% | 0 | 0 |
| **>> Total Zone Loads** | **-** | **373** | **0** | **-** | **0** | **0** |

| TABLE 4.1.B. Envelope Loads For Space "1212 TOILET (3 STALLS)" In Zone "VAV-3-4" | | | | | | |
|---|---|---|---|---|---|---|
| | | | | COOLING | COOLING | HEATING |
| | Area | U-Value | Shade | TRANS | SOLAR | TRANS |
| | (ft²) | (BTU/(hr·ft²·°F)) | Coeff. | (BTU/hr) | (BTU/hr) | (BTU/hr) |

## Appendix

4 Draft CostEstimate

- Draft Estimate Comparison
- CMR draft estimate
- Designer draft estimate
- OPM draft estimate and comparison analysis

**Framingham**
**New Fuller Middle School**
**Draft 90% CD Construction Estimate Comparison**

PROJECT MANAGEMENT SMMA

Dated 9/27/19 (updated 9/30/19

| | Consigli Final 60% CD Estimate 8/5/19 | | Consigli Draft 90% CD Estimate 9/27/19 | | Delta from Final 60% Estimate | Myakoda Draft 90% CD Estimate 9/30/19 | | Delta from Final 60% Estimate | Fogarty Draft 90% CD Estimate 9/26/19 | | Delta from Final 60% Estimate |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SF | 136,790 | | 136,790 | | | 136,790 | | | 136,790 | | |
| Division 1 - General Requirements | $ 75,000 | | $ 75,000 | | $ - | $ - | | $ (75,000) | $ - | | $ (75,000) |
| Division 2 - Existing Conditions | $ 2,872,380 | | $ 2,970,080 | | $ 97,700 | $ 2,759,990 | | $ (112,390) | $ 2,764,490 | | $ (107,890) |
| Division 3 - Concrete | $ 2,772,478 | | $ 32,850 | | $ (2,739,628) | $ 111,548 | | $ (2,660,930) | $ - | | $ (2,772,478) |
| Division 4 - Masonry | $ 2,015,845 | | $ 2,296,835 | | $ 280,990 | $ 2,456,979 | | $ 441,134 | $ 1,794,046 | | $ (221,799) |
| Division 5 - Metals | $ 5,438,115 | | $ 873,350 | | $ (4,564,765) | $ 1,830,093 | | $ (3,608,022) | $ 1,765,905 | | $ (3,672,210) |
| Division 6 - Wood, Plastics and Composites | $ 2,101,375 | | $ 2,106,225 | | $ 4,850 | $ 1,242,083 | | $ (859,292) | $ 1,080,017 | | $ (1,021,358) |
| Division 7 - Thermal and Moisture Protection | $ 3,789,139 | | $ 3,751,202 | | $ (37,937) | $ 3,927,436 | | $ 138,297 | $ 4,342,706 | | $ 553,567 |
| Division 8 - Openings | $ 4,382,132 | | $ 4,329,350 | | $ (52,782) | $ 5,373,104 | | $ 990,972 | $ 4,171,037 | | $ (211,095) |
| Division 9 - Finishes | $ 7,991,673 | | $ 9,604,268 | | $ 1,612,595 | $ 6,538,330 | | $ (1,453,343) | $ 8,319,458 | | $ 327,785 |
| Division 10 - Specialties | $ 1,087,728 | | $ 1,158,642 | | $ 70,914 | $ 1,371,594 | | $ 283,866 | $ 937,405 | | $ (150,323) |
| Division 11 - Equipment | $ 1,431,329 | | $ 1,438,829 | | $ 7,500 | $ 1,568,448 | | $ 137,119 | $ 1,615,962 | | $ 184,633 |
| Division 12 - Furnishings | $ 668,465 | | $ 646,985 | | $ (21,480) | $ 1,138,179 | | $ 469,714 | $ 1,785,278 | | $ 1,116,813 |
| Division 13 - Special Construction | $ - | | $ - | | $ - | $ - | | $ - | $ - | | $ - |
| Division 14 - Conveying Equipment | $ 220,000 | | $ 220,000 | | $ - | $ 205,000 | | $ (15,000) | $ 212,000 | | $ (8,000) |
| Division 21 - Fire Suppression | $ 791,653 | $6 | $ 914,839 | $7 | $ 123,186 | $ 863,994 | $6 | $ 72,341 | $ 853,485 | $6 | $ 61,832 |
| Division 22 - Plumbing | $ 2,195,545 | $16 | $ 1,935,182 | $14 | $ (260,363) | $ 2,126,673 | $16 | $ (68,872) | $ 2,148,401 | $16 | $ (47,144) |
| Division 23 - HVAC | $ 7,967,908 | $58 | $ 7,946,076 | $58 | $ (21,832) | $ 7,879,869 | $58 | $ (88,039) | $ 8,281,591 | $61 | $ 313,683 |
| Division 26 - Electrical | $ 5,663,400 | $41 | $ 6,291,566 | $46 | $ 628,166 | $ 5,986,215 | $44 | $ 322,815 | $ 5,947,549 | $43 | $ 284,149 |
| Division 31 - Earthwork | $ - | | $ - | | $ - | $ 272,455 | | $ 272,455 | $ 464,732 | | $ 464,732 |
| Division 32 - Exterior Improvements | $ 1,605,665 | | $ 1,468,942 | | $ (136,723) | $ 1,828,819 | | $ 223,154 | $ 918,067 | | $ (687,598) |
| Division 33 - Utilities | $ - | | $ 3,500 | | $ 3,500 | $ - | | $ - | $ 291,650 | | $ 291,650 |
| | $ 53,069,830 | $388 | $ 48,063,721 | $351 | -$5,006,109 | $ 47,480,809 | $347 | -$5,589,021 | $ 47,693,779 | $349 | -$5,376,051 |
| Total Trade Cost | $ 53,069,830 | | $ 48,063,721 | | -$5,006,109 | $ 47,480,809 | | | $ 47,693,779 | | |
| General Conditions | $ 3,401,447 | | $ 2,931,033 | | -$470,414 | $ 2,931,033 | | -$470,414 | $ 2,931,033 | | -$470,414 |
| General Requirements | $ 2,652,482 | | $ 2,289,380 | | -$363,102 | $ 2,289,380 | | -$363,102 | $ 2,389,380 | | -$263,102 |
| Insurance | $ 668,571 | | $ 576,109 | | -$92,462 | $ 576,109 | | -$92,462 | $ 576,109 | | -$92,462 |
| Bonds | $ - | | $ - | | $0 | $ - | | $0 | $ - | | $0 |
| Sub Bonds | $ 742,977 | | $ 672,892 | | -$70,085 | $ 672,892 | | -$70,085 | $ - | | -$742,977 |
| Builders Risk | $ - | | $ - | | $0 | $ - | | $0 | $ - | | $0 |
| Permit | $ - | | $ - | | $0 | $ - | | $0 | $ - | | $0 |
| Fee | $ 1,337,143 | | $ 1,152,218 | | -$184,925 | $ 1,152,218 | | -$184,925 | $ 1,152,218 | | -$184,925 |
| Design Contingency | $ 2,653,491 | | $ 1,441,912 | 3% | -$1,211,579 | $ 1,424,424 | 3% | -$1,229,067 | $ 953,876 | 2% | -$1,699,615 |
| GMP Contingency | $ 1,432,554 | | $ 1,266,839 | | -$165,715 | $ 1,239,014 | | -$193,540 | $ 1,216,191 | | -$216,363 |
| Escalation | $ 835,850 | | $ 495,056 | 1% | -$340,794 | $ 655,330 | 1% | -$180,520 | $ 498,638 | 1% | -$337,212 |
| | $ 13,724,515 | | $ 10,825,439 | | -$2,899,076 | $ 10,940,400 | | -$2,784,115 | $ 9,717,445 | | -$4,007,070 |
| Early Site Package | $ 10,957,843 | | $ 10,957,843 | | $0 | $ 10,957,843 | | $0 | $ 10,956,907 | | -$936 |
| Early Concrete and Steel Package | | | $ 8,716,894 | | $8,716,894 | $ 8,738,800 | | $8,738,800 | $ 8,738,801 | | $8,738,801 |
| Buy Savings | | | $ (50,755) | | -$50,755 | $ (182,955) | | | | | |
| Total Construction Cost | $ 77,752,188 | $568 | $ 78,513,142 | $574 | $760,954 | $ 77,934,897 | $570 | $182,709 | $ 77,106,932 | $564 | -$645,256 |
| Post 60% VE ** | $ (487,000) | | | | | | | | | | |
| Adjusted Cost | $ 77,265,188 | | $ 78,513,142 | | $1,247,954 | $ 77,934,897 | | $669,709 | $ 77,106,932 | | -$158,256 |
| Construction Cost Budget | $ 77,935,429 | | $ 77,935,429 | | | $ 77,935,429 | | | $ 77,935,429 | | |
| Delta | $ (670,241) | | $ 577,713 | | | $ (532) | | | $ (828,497) | | |

**

Remove the raised traffic table on Flagg Drive – Deduct $247,000
Remove the stepped terraces on the amphitheater – Deduct $139,000
Change the Centralized pH Neutralization System to a point of use system – Deduct $101,000

# 90% CD Estimate

CONSIGLI
Est. 1905

**Town of Framingham**
Fuller Middle School
Framingham, MA
September 27, 2019

**SUBMITTED BY:**

Consigli Construction Co., Inc.
72 Sumner Street
Milford, MA 01757

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Fuller Middle School

CONSIGLI
Est. 1905

## The Right Choice

Consigli Construction Co., Inc. is a fourth-generation family owned organization that can offer the resources and experience of one of the strongest construction management firms in the Northeast with the creativity and flexibility of a start-up.

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| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **A Substructure** | | | |
| A10 Foundations | | | |
| A1010 Standard Foundations | 136,600 sf | /sf | |
| A1030 Slab on Grade | 136,600 sf | /sf | |
| A10 Foundations | 136,600 sf | /sf | |
| **A Substructure** | **136,600 sf** | **/sf** | |
| **B Shell** | | | |
| B10 Superstructure | | | |
| B1010 Floor Construction | 136,600 sf | 1.55 /sf | 211,720 |
| B1020 Roof Construction | 136,600 sf | 1.39 /sf | 190,225 |
| B10 Superstructure | 136,600 sf | 2.94 /sf | 401,945 |
| B20 Exterior Enclosure | | | |
| B2010 Exterior Walls | 136,600 sf | 36.67 /sf | 5,008,543 |
| B2020 Exterior Windows | 136,600 sf | 12.28 /sf | 1,676,839 |
| B2030 Exterior Doors | 136,600 sf | 1.23 /sf | 167,968 |
| B20 Exterior Enclosure | 136,600 sf | 50.17 /sf | 6,853,350 |
| B30 Roofing | | | |
| B3010 Roof Coverings | 136,600 sf | 13.55 /sf | 1,850,807 |
| B3020 Roof Openings | 136,600 sf | 5.07 /sf | 693,000 |
| B30 Roofing | 136,600 sf | 18.62 /sf | 2,543,807 |
| **B Shell** | **136,600 sf** | **71.74 /sf** | **9,799,101** |
| **C Interiors** | | | |
| C10 Interior Construction | | | |
| C1010 Partitions | 136,600 sf | 38.28 /sf | 5,229,438 |
| C1020 Interior Doors | 136,600 sf | 7.17 /sf | 979,098 |
| C1030 Specialties/Millwork | 136,600 sf | 7.07 /sf | 966,182 |
| C10 Interior Construction | 136,600 sf | 52.52 /sf | 7,174,718 |
| C20 Stairs | | | |
| C2010 Stair Construction | 136,600 sf | 2.50 /sf | 342,000 |
| C2020 Stair Finishes | 136,600 sf | 0.12 /sf | 16,160 |
| C20 Stairs | 136,600 sf | 2.62 /sf | 358,160 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **C30 Interior Finishes** | | | |
| C3010 Wall Finishes | 136,600 sf | 11.33 /sf | 1,547,373 |
| C3020 Floor Finishes | 136,600 sf | 10.15 /sf | 1,387,030 |
| C3030 Ceiling Finishes | 136,600 sf | 17.78 /sf | 2,428,588 |
| C30 Interior Finishes | 136,600 sf | 39.26 /sf | 5,362,991 |
| **C Interiors** | **136,600 sf** | **94.41 /sf** | **12,895,869** |
| **D Services** | | | |
| **D10 Conveying Systems** | | | |
| D1010 Elevators & Lifts | 136,600 sf | 1.61 /sf | 220,450 |
| D10 Conveying Systems | 136,600 sf | 1.61 /sf | 220,450 |
| **D20 Plumbing** | | | |
| D2010 Plumbing | 136,600 sf | 3.05 /sf | 416,156 |
| D2020 Domestic Water Distribution | 136,600 sf | 3.96 /sf | 540,525 |
| D2030 Sanitary Waste | 136,600 sf | 2.51 /sf | 343,448 |
| D2040 Rain Water Drainage | 136,600 sf | 1.62 /sf | 221,676 |
| D2090 Other Plumbing Systems | 136,600 sf | 3.48 /sf | 475,103 |
| D20 Plumbing | 136,600 sf | 14.62 /sf | 1,996,907 |
| **D30 Heating, Ventilating, and Air Conditioning (HVAC)** | | | |
| D3010 Energy Supply | 136,600 sf | 9.29 /sf | 1,268,916 |
| D3020 HVAC | 136,600 sf | 1.20 /sf | 163,945 |
| D3030 Cooling Generating Systems | 136,600 sf | 2.85 /sf | 389,905 |
| D3040 HVAC Distribution | 136,600 sf | 17.06 /sf | 2,329,778 |
| D3050 Terminal & Package Units | 136,600 sf | 17.52 /sf | 2,393,325 |
| D3060 HVAC Instrumentation & Controls | 136,600 sf | 5.49 /sf | 749,864 |
| D3070 Testing, Adjusting & Balancing | 136,600 sf | 0.65 /sf | 88,790 |
| D3090 Other HVAC Systems & Equipment | 136,600 sf | 3.66 /sf | 499,829 |
| D30 Heating, Ventilating, and Air Conditioning (HVAC) | 136,600 sf | 57.72 /sf | 7,884,351 |
| **D40 Fire Protection Systems** | | | |
| D4010 Sprinklers | 136,600 sf | 6.32 /sf | 863,266 |
| D4020 Standpipes | 136,600 sf | 0.17 /sf | 22,839 |
| D4030 Fire Protection Specialties | 136,600 sf | 0.08 /sf | 10,734 |
| D4090 Other Fire Protection Systems | 136,600 sf | 0.13 /sf | 18,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| D40 Fire Protection Systems | 136,600 sf | 6.70 /sf | 914,839 |
| D50 Electrical Systems | | | |
| D5010 Gear & Distribution | 136,600 sf | 8.18 /sf | 1,117,861 |
| D5020 Lighting & Branch Wiring | 136,600 sf | 17.61 /sf | 2,405,966 |
| D5030 Communications & Security | 136,600 sf | 12.09 /sf | 1,652,074 |
| D5090 Other Electrical Systems | 136,600 sf | 3.95 /sf | 538,839 |
| D50 Electrical Systems | 136,600 sf | 41.84 /sf | 5,714,740 |
| D Services | 136,600 sf | 122.48 /sf | 16,731,287 |
| E Equipment & Furnishings | | | |
| E10 Equipment | | | |
| E1020 Institutional Equipment | 136,600 sf | 12.13 /sf | 1,656,689 |
| E1090 Other Equipment | 136,600 sf | 0.18 /sf | 24,600 |
| E10 Equipment | 136,600 sf | 12.31 /sf | 1,681,288 |
| E20 Furnishings | | | |
| E2010 Fixed Furnishings | 136,600 sf | 12.84 /sf | 1,754,375 |
| E20 Furnishings | 136,600 sf | 12.84 /sf | 1,754,375 |
| E Equipment & Furnishings | 136,600 sf | 25.15 /sf | 3,435,664 |
| F Special Construction & Demolition | | | |
| F20 Demolition | | | |
| F2010 Building Elements Demolition | 194,500 sf | 7.03 /sf | 1,367,800 |
| F2020 Hazardous Component Abatement | 194,500 sf | 8.24 /sf | 1,602,280 |
| F20 Demolition | 194,500 sf | 15.27 /sf | 2,970,080 |
| F Special Construction & Demolition | 194,500 sf | 15.27 /sf | 2,970,080 |
| G Sitework | | | |
| G10 Site Preparation | | | |
| G1010 Site Clearing | 136,600 sf | /sf | |
| G1020 Site Demolition & Relocations | 136,600 sf | 0.07 /sf | 9,000 |
| G1030 Site Earthwork | 136,600 sf | 3.01 /sf | 410,790 |
| G10 Site Preparation | 136,600 sf | 3.07 /sf | 419,790 |
| G20 Site Improvements | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| G2010 Roadways | 136,600 sf | /sf | |
| G2020 Parking Lots | 136,600 sf | /sf | |
| G2030 Pedestrian Paving | 136,600 sf | 0.05 /sf | 7,140 |
| G2040 Site Development | 136,600 sf | 2.97 /sf | 405,650 |
| G2050 Landscaping | 136,600 sf | 6.02 /sf | 822,312 |
| G20 Site Improvements | 136,600 sf | 9.04 /sf | 1,235,102 |
| G30 Site Civil/Mechanical Utilites | | | |
| G3010 Water Supply | 136,600 sf | /sf | |
| G3020 Sanitary Sewer | 136,600 sf | /sf | |
| G3030 Storm Drainage | 136,600 sf | /sf | |
| G3060 Fuel Distribution | 136,600 sf | /sf | |
| G30 Site Civil/Mechanical Utilites | 136,600 sf | /sf | |
| G40 Site Electrical Utilities | | | |
| G4010 Electrical Distribution | 136,600 sf | 1.22 /sf | 166,498 |
| G4020 Site Lighting | 136,600 sf | 2.57 /sf | 350,530 |
| G4030 Site Communications & Security | 136,600 sf | 0.44 /sf | 59,799 |
| G40 Site Electrical Utilities | 136,600 sf | 4.22 /sf | 576,826 |
| G Sitework | 136,600 sf | 16.34 /sf | 2,231,718 |

## Estimate Totals

| Description | Amount | Totals | Rate | Cost per Unit |
|---|---|---|---|---|
| Subtotal | **48,063,718** | **48,063,718** | | **351.86 /sf** |
| Design/Estimate Contingency | 1,441,912 | | 3.000 % | 10.56 /sf |
| Escalation | 495,056 | | 1.000 % | 3.62 /sf |
| **Subtotal** | **1,936,968** | **50,000,686** | | **366.04 /sf** |
| SDI (Non-Trade Contracts) | 269,858 | | 1.400 % | 1.98 /sf |
| Sub Bonds (Trade Contracts) | 403,034 | | 1.400 % | 2.95 /sf |
| Contractor's Contingency | 1,266,839 | | 2.500 % | 9.27 /sf |
| General Conditions | 2,931,033 | | | 21.46 /sf |
| General Requirements | 2,289,380 | | | 16.76 /sf |
| **Subtotal** | **7,160,144** | **57,160,830** | | **418.45 /sf** |
| Builder's Risk Insurance - BP1 | | | | |
| General Liability Insurance | 576,109 | | | 4.22 /sf |
| Building Permit - NIC | | | | |
| Performance & Payment Bond | | | | |
| **Subtotal** | **576,109** | **57,736,939** | | **422.67 /sf** |
| Fee | 1,152,218 | | | 8.43 /sf |
| Amendment #1 - Sitework | 10,957,843 | | | 80.22 /sf |
| Amendment #2 - Concrete & Steel | 8,716,894 | | | 63.81 /sf |
| Amendment #2 - Buy Savings | (50,755) | | | (0.37) /sf |
| **Total** | | **78,513,139** | | **574.77 /sf** |

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*Est. 1905*

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **A Substructure** | | | |
| **A10 Foundations** | | | |
| **A1010 Standard Foundations** | | | |
| Lull, laborer for cleanup by Consigli (Concrete) | (1) ls | 116,000.00 /ls | (116,000) |
| Trade support - lull, laborer for cleanup (Concrete) | 1 ls | 116,000.00 /ls | 116,000 |
| *Elevator pit* | *BP#2* | */BP#2* | |
| *F3 spread footings* | *BP#2* | */BP#2* | |
| *F4 spread footings* | *BP#2* | */BP#2* | |
| *F5 spread footings* | *BP#2* | */BP#2* | |
| *F6 spread footings* | *BP#2* | */BP#2* | |
| *F7 spread footings* | *BP#2* | */BP#2* | |
| *F8 spread footings* | *BP#2* | */BP#2* | |
| *F9 spread footings* | *BP#2* | */BP#2* | |
| *F10 spread footings* | *BP#2* | */BP#2* | |
| *F11 spread footings* | *BP#2* | */BP#2* | |
| *F12 spread footings* | *BP#2* | */BP#2* | |
| *Continuous footings - 3'x12"* | *BP#2* | */BP#2* | |
| *Continuous footings - 4'x12"* | *BP#2* | */BP#2* | |
| *Continuous footings - 5'x12" @ Bandshell* | *BP#2* | */BP#2* | |
| *Foundation walls - 16"* | *BP#2* | */BP#2* | |
| *Foundation walls - 16" @ Bandshell* | *BP#2* | */BP#2* | |
| *Foundation walls - 21"* | *BP#2* | */BP#2* | |
| *Retaining walls - 16"* | *BP#2* | */BP#2* | |
| *Concrete walls @ Auditorium* | *BP#2* | */BP#2* | |
| *Piers - 24"x24"* | *BP#2* | */BP#2* | |
| *Grade beam 1* | *BP#2* | */BP#2* | |
| *Grade beam 2* | *BP#2* | */BP#2* | |
| *Foundation wall insulation* | *BP#2* | */BP#2* | |
| *Dampproofing at foundation wall* | *BP#2* | */BP#2* | |
| *Foundation wall waterproofing - membrane w/ drainage board* | *BP#2* | */BP#2* | |
| *Elevator pit waterproofing - cementitious* | *BP#2* | */BP#2* | |
| *Site cuts to site fills* | *BP#1* | */BP#1* | |
| *Excavation @ foundations* | *BP#1* | */BP#1* | |
| *Fill to subgrade @ building footprint - import (structural fill)* | *BP#1* | */BP#1* | |
| *Crushed stone base beneath column & wall footings* | *BP#1* | */BP#1* | |
| *Excavate for elevator pits* | *BP#1* | */BP#1* | |
| *Dewatering* | *BP#1* | */BP#1* | |
| *Additional dewatering* | *BP#1* | */BP#1* | |
| *Site surcharge/rigid inclusion* | *BP#1* | */BP#1* | |
| *Rammed aggregate piers* | *BP#1* | */BP#1* | |
| *Rigid inclusions Gym and Auditorium* | *BP#1* | */BP#1* | |

| Description | Takeoff Quantity | | Total Cost/Unit | | Total Amount |
|---|---|---|---|---|---|
| *A1010 Standard Foundations* | **136,600** | *sf* | | */sf* | |
| **A1030 Slab on Grade** | | | | | |
| *Slab depressions* | | *BP#2* | | */BP#2* | |
| *Slab on grade - 5"* | | *BP#2* | | */BP#2* | |
| *Power trowel/seal concrete @ Auditorium* | | *BP#2* | | */BP#2* | |
| *Underslab insulation (perimeter only)* | | *BP#2* | | */BP#2* | |
| *Crushed stone base beneath S.O.G* | | *BP#1* | | */BP#1* | |
| *Fine grade under building* | | *BP#1* | | */BP#1* | |
| *Excavate/backfill utilities under SOG by machine* | | *BP#1* | | */BP#1* | |
| *A1030 Slab on Grade* | **136,600** | *sf* | | */sf* | |
| **A10 Foundations** | **136,600** | **sf** | | **/sf** | |
| **A Substructure** | **136,600** | **sf** | | **/sf** | |
| **B Shell** | | | | | |
| **B10 Superstructure** | | | | | |
| **B1010 Floor Construction** | | | | | |
| *Place & finish slabs - 3-1/4" on 3" deck @ floor (LW)* | | *BP#2* | | */BP#2* | |
| *Topping slab @ Breakout LGMF floors* | | *BP#2* | | */BP#2* | |
| *Moment connections @ floor* | | *BP#2* | | */BP#2* | |
| *Steel @ floors* | | *BP#2* | | */BP#2* | |
| *Steel hangers - AESS* | | *BP#2* | | */BP#2* | |
| *Steel @ floors - VM-S05* | | *BP#2* | | */BP#2* | |
| *Steel @ Canopy - AESS* | | *BP#2* | | */BP#2* | |
| *Relieving angles @ brick veneer* | | *BP#2* | | */BP#2* | |
| *Shoring @ Learning Commons* | | *BP#2* | | */BP#2* | |
| *Metal floor decking - galvanized (3" 18g)* | | *BP#2* | | */BP#2* | |
| *Metal floor decking @ Breakout room LGMF floors* | | *BP#2* | | */BP#2* | |
| Sprayed fireproofing - steel beams and columns @ floor structure | 64,740 | sf | 3.00 | /sf | 194,220 |
| Patch Sprayed fireproofing - floor structure | 5 | days | 3,500.00 | /days | 17,500 |
| *B1010 Floor Construction* | **136,600** | *sf* | *1.55* | */sf* | *211,720* |
| **B1020 Roof Construction** | | | | | |
| *Place & finish slabs - 2-1/2" on 3" deck @ roof* | | *BP#2* | | */BP#2* | |
| *Place & finish slabs - 3-1/4" on 3" deck @ roof* | | *BP#2* | | */BP#2* | |
| *Moment connections @ roof* | | *BP#2* | | */BP#2* | |
| *Steel @ screen wall - galvanized* | | *BP#2* | | */BP#2* | |
| *Steel @ roof* | | *BP#2* | | */BP#2* | |
| *Steel dunnage - RTU & chiller* | | *BP#2* | | */BP#2* | |
| *Open web joists, bridging* | | *BP#2* | | */BP#2* | |
| *Metal roof decking - acoustical (3" 18/16g)* | | *BP#2* | | */BP#2* | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **B1020 Roof Construction** | | | |
| *Metal roof decking - galvanized (1-1/2" 20g)* | *BP#2* | */BP#2* | |
| *Metal roof decking - acoustical (1-1/2" 20g)* | *BP#2* | */BP#2* | |
| *Metal roof decking - galvanized (3" 18g)* | *BP#2* | */BP#2* | |
| Sprayed fireproofing - steel beams and columns @ roof structure below 20' | 33,575 sf | 3.00 /sf | 100,725 |
| Patch Sprayed fireproofing - roof structure | 5 days | 3,500.00 /days | 17,500 |
| Intumescent fireproofing @ Learning Commons | 1 ls | 72,000.00 /ls | 72,000 |
| *B1020 Roof Construction* | **136,600** *sf* | *1.39 /sf* | *190,225* |
| **B10 Superstructure** | **136,600 sf** | **2.94 /sf** | **401,945** |
| **B20 Exterior Enclosure** | | | |
| **B2010 Exterior Walls** | | | |
| Exterior wall mockup - Masonry, Allowance | 1 allw | 7,500.00 /allw | 7,500 |
| *Exterior wall mockup - Steel, Allowance* | *BP#2* | */BP#2* | |
| Exterior wall mockup - Siding, Allowance | 1 allw | 10,000.00 /allw | 10,000 |
| Exterior wall mockup - Waterproofing, Allowance | 1 allw | 5,000.00 /allw | 5,000 |
| Exterior wall mockup - Roofing, Allowance | 1 allw | 2,500.00 /allw | 2,500 |
| Exterior wall mockup - Drywall, Allowance | 1 allw | 10,000.00 /allw | 10,000 |
| Temporary bracing of CMU @ Gym and Auditorium | 1 ls | 100,000.00 /ls | 100,000 |
| Exterior staging | 40,145 sf | 2.50 /sf | 100,363 |
| Masonry winter conditions/heat | 12 wks | 5,000.00 /wks | 60,000 |
| Lull, laborer for cleanup by Consigli (Masonry) | (1) ls | 77,000.00 /ls | (77,000) |
| Lull, laborer for cleanup by Consigli (Waterproofing) | (1) ls | 29,000.00 /ls | (29,000) |
| Lull, laborer for cleanup by Consigli (Siding) | (1) ls | 48,000.00 /ls | (48,000) |
| Trade support - lull, laborer for cleanup (Masonry) | 1 ls | 77,000.00 /ls | 77,000 |
| Trade support - lull, laborer for cleanup (Waterproofing) | 1 ls | 29,000.00 /ls | 29,000 |
| Trade support - lull, laborer for cleanup (Siding) | 1 ls | 48,000.00 /ls | 48,000 |
| Precast planters | 25 lf | 750.00 /lf | 18,750 |
| Install loose lintels (< 8") | 14 ea | 150.00 /ea | 2,100 |
| 4x4x12 iron spot brick veneer, scored | 6,815 sf | 36.00 /sf | 245,340 |
| 4x8x8 iron spot brick veneer, scored | 6,750 sf | 36.00 /sf | 243,000 |
| Brick veneer, precast cap @ entry wall per A102A | 25 lf | 285.00 /lf | 7,125 |
| 4x4x12 scored ground faced CMU veneer | 2,970 sf | 27.00 /sf | 80,190 |
| 4x8x16 scored ground faced CMU veneer | 23,615 sf | 29.00 /sf | 684,835 |
| CMU - 12" exterior wall | 15,795 sf | 25.00 /sf | 394,875 |
| Loose lintels - Furnish | 95 lf | 25.00 /lf | 2,375 |
| Guardrails - 42" galvanized perforated @ exterior | 105 lf | 500.00 /lf | 52,500 |
| Guardrails - 42" galvanized perforated @ terrace | 30 lf | 500.00 /lf | 15,000 |
| Misc. caulking & sealants @ exterior | 73,210 sf | 0.75 /sf | 54,908 |
| Mineral wool insulation at brick/CMU veneer | 40,145 sf | 3.50 /sf | 140,508 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **B2010 Exterior Walls** | | | |
| Air and vapor barrier @ exterior walls | 56,650 sf | 7.50 /sf | 424,875 |
| Air and vapor barrier @ soffits | 1,245 sf | 7.50 /sf | 9,338 |
| Air and vapor barrier @ phenolic fins per A102A, A315 | 380 sf | 7.50 /sf | 2,850 |
| Corrugated, perforated metal siding @ screen walls | 1,105 sf | 45.00 /sf | 49,725 |
| Exposed fastener metal panel | 6,065 sf | 45.00 /sf | 272,925 |
| Composite metal panel siding | 3,120 sf | 75.00 /sf | 234,000 |
| Phenolic panel siding | 7,705 sf | 80.00 /sf | 616,400 |
| Metal louver | 625 sf | 85.00 /sf | 53,125 |
| Exterior walls - 10" studs, 1/2" sheathing, 5/8" GWB, insulation | 44,220 sf | 23.50 /sf | 1,039,170 |
| Framing @ phenolic fins per A102A, A315 | 380 sf | 7.65 /sf | 2,907 |
| Exterior soffit framing, sheathing, insulation | 1,245 sf | 23.90 /sf | 29,756 |
| Misc. exterior painting | 73,210 sf | 0.50 /sf | 36,605 |
| *B2010 Exterior Walls* | ***136,600 sf*** | *36.67 /sf* | *5,008,543* |
| **B2020 Exterior Windows** | | | |
| Exterior wall mockup - Windows, Allowance | 1 allw | 20,000.00 /allw | 20,000 |
| Lull, laborer for cleanup by Consigli (Windows) | (1) ls | 73,000.00 /ls | (73,000) |
| Trade support - lull, laborer for cleanup (Windows) | 1 ls | 73,000.00 /ls | 73,000 |
| Window blocking | 7,425 lf | 12.75 /lf | 94,669 |
| Door blocking - exterior | 265 lf | 13.85 /lf | 3,671 |
| Caulking @ storefront/curtainwall | 7,425 lf | 4.00 /lf | 29,700 |
| Window transitions | 7,425 lf | 10.00 /lf | 74,250 |
| Aluminum storefront/windows | 11,555 sf | 100.00 /sf | 1,155,500 |
| Aluminum storefront - School Guard | 545 sf | 140.00 /sf | 76,300 |
| Extruded aluminum perimeter angles | 7,425 lf | 30.00 /lf | 222,750 |
| *B2020 Exterior Windows* | ***136,600 sf*** | *12.28 /sf* | *1,676,839* |
| **B2030 Exterior Doors** | | | |
| Install exterior door, HW | 14 ea | 300.00 /ea | 4,200 |
| HM doors - exterior flush | 23 lvs | 625.00 /lvs | 14,375 |
| HM frames - exterior single | 5 ea | 255.00 /ea | 1,275 |
| HM frames - exterior double | 9 ea | 440.00 /ea | 3,960 |
| Overhead coiling door | 1 ea | 7,500.00 /ea | 7,500 |
| Aluminum entrance doors, HW - exterior | 4 lvs | 6,000.00 /lvs | 24,000 |
| Aluminum entrance doors, HW - exterior, School Guard | 11 lvs | 7,000.00 /lvs | 77,000 |
| Hardware sets - exterior door/panic | 14 set | 1,920.01 /set | 26,880 |
| Hardware sets - auto operators | 1 set | 4,500.00 /set | 4,500 |
| Install HM door frames - exterior single | 5 ea | 73.00 /ea | 365 |
| Install HM door frames - exterior double | 9 ea | 117.00 /ea | 1,053 |
| Paint HM doors - exerior | 23 lvs | 90.00 /lvs | 2,070 |
| Paint HM frames - exterior, single | 5 ea | 50.00 /ea | 250 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **B2030 Exterior Doors** | | | |
| Paint HM frames - exterior, double | 9 ea | 60.00 /ea | 540 |
| *B2030 Exterior Doors* | **136,600** *sf* | *1.23 /sf* | *167,968* |
| **B20 Exterior Enclosure** | **136,600 sf** | **50.17 /sf** | **6,853,350** |
| **B30 Roofing** | | | |
| **B3010 Roof Coverings** | | | |
| Roof blocking | 10,780 lf | 32.00 /lf | 344,960 |
| PVC membrane roof w/insulation, underlayment, cover board, vapor barrier | 63,155 sf | 18.25 /sf | 1,152,579 |
| PVC membrane @ walls | 2,740 sf | 20.25 /sf | 55,485 |
| Reinforced walkway pads | 715 sf | 7.50 /sf | 5,363 |
| Pavers - terrace | 295 sf | 35.00 /sf | 10,325 |
| Pavers - main entrance | 780 sf | 35.00 /sf | 27,300 |
| Roof accessories | 63,155 sf | 0.35 /sf | 22,104 |
| Roof vents & hatches | 1 ls | 25,000.00 /ls | 25,000 |
| Metal roof facia | 2,695 lf | 35.00 /lf | 94,325 |
| Additional flashing, scuppers | 63,155 sf | 0.75 /sf | 47,366 |
| Polycarbonate glazing @ canopy | 440 sf | 150.00 /sf | 66,000 |
| *B3010 Roof Coverings* | **136,600** *sf* | *13.55 /sf* | *1,850,807* |
| **B3020 Roof Openings** | | | |
| Metal-framed skylights (8:12) | 4,130 sf | 150.00 /sf | 619,500 |
| Metal-framed skylights gable ends | 490 sf | 150.00 /sf | 73,500 |
| *B3020 Roof Openings* | **136,600** *sf* | *5.07 /sf* | *693,000* |
| **B30 Roofing** | **136,600 sf** | **18.62 /sf** | **2,543,807** |
| **B Shell** | **136,600 sf** | **71.74 /sf** | **9,799,101** |
| **C Interiors** | | | |
| **C10 Interior Construction** | | | |
| **C1010 Partitions** | | | |
| Lull, laborer for cleanup by Consigli (Drywall) | (1) ls | 188,000.00 /ls | (188,000) |
| Trade support - lull, laborer for cleanup (Drywall) | 1 ls | 188,000.00 /ls | 188,000 |
| CMU - 12" interior wall | 6,890 sf | 25.00 /sf | 172,250 |
| CMU - ground face block, premium | 1 ls | 35,000.00 /ls | 35,000 |
| CMU - acoustical block, premium | 1 ls | 5,000.00 /ls | 5,000 |
| Light gage metal framing @ Breakout floors | 1,440 sf | 60.00 /sf | 86,400 |
| Light gage metal framing @ Breakout walls | 16,820 sf | 25.00 /sf | 420,500 |
| Misc. metal fabrications | 136,600 sf | 1.00 /sf | 136,600 |
| Seismic clips - 4' OC, each side | 270 ea | 60.00 /ea | 16,200 |
| *Steel angles/stantions @ locker guardrail* | *BP#2* | */BP#2* | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **C1010 Partitions** | | | |
| Handrail @ steps/ramps | 55 lf | 295.00 /lf | 16,225 |
| Cane rails | 120 lf | 200.00 /lf | 24,000 |
| In-wall blocking | 12,160 lf | 12.75 /lf | 155,040 |
| Miscellaneous rough carpentry - Allowance | 136,600 sf | 0.65 /sf | 88,790 |
| Caulking & sealants @ interior | 136,600 sf | 0.90 /sf | 122,940 |
| Firestopping @ rated walls | 5,630 lf | 16.20 /lf | 91,206 |
| Miscellaneous firestopping | 136,600 sf | 0.10 /sf | 13,660 |
| Aluminum storefront - interior, School Guard | 340 sf | 140.00 /sf | 47,600 |
| Aluminum windows - interior, School Guard | 2 ea | 12,000.00 /ea | 24,000 |
| Misc. interior glass & glazing | 136,600 sf | 0.25 /sf | 34,150 |
| Glazed partition | 4,700 sf | 60.00 /sf | 282,000 |
| Glazed partition - double acoustic | 625 sf | 110.00 /sf | 68,750 |
| Glazed partition @ sidelights | 1,165 sf | 75.00 /sf | 87,375 |
| Glass walls @ Breakout | 2,005 sf | 120.00 /sf | 240,600 |
| Glass roof @ Breakout | 70 sf | 150.00 /sf | 10,500 |
| Graduated glass film | 3,675 sf | 5.00 /sf | 18,375 |
| 3M Safety and Security Window Film @ glass walls | 4,090 sf | 15.00 /sf | 61,350 |
| 3M Safety and Security Window Film @ doors | 67 lvs | 450.00 /lvs | 30,150 |
| Level 5 finish - Allowance | 25,000 sf | 2.55 /sf | 63,750 |
| Interior wall framing - 2-1/2" | 3,370 sf | 5.75 /sf | 19,378 |
| Interior wall framing - 3-5/8"/4" | 96,355 sf | 5.75 /sf | 554,041 |
| Interior wall framing - 6" | 7,050 sf | 7.65 /sf | 53,933 |
| Interior wall framing - 8" | 21,965 sf | 10.15 /sf | 222,945 |
| Interior wall framing - 10" | 555 sf | 12.10 /sf | 6,716 |
| GWB - 5/8", level 4 | 229,230 sf | 4.15 /sf | 951,305 |
| GWB - 5/8", additional layer | 96,320 sf | 3.50 /sf | 336,627 |
| GWB - high impact | 1 ls | 50,000.00 /ls | 50,000 |
| Shaft liner - 1" | 2,420 sf | 4.15 /sf | 10,043 |
| Sound batt insulation | 137,275 sf | 1.60 /sf | 219,640 |
| Half height walls @ Auditorium | 400 sf | 22.90 /sf | 9,160 |
| LGMF framing @ locker guardrail | 4,095 sf | 5.10 /sf | 20,885 |
| GWB - 5/8", level 5 @ locker guardrail | 4,095 sf | 6.70 /sf | 27,437 |
| Curved walls - premium | 5,205 sf | 6.35 /sf | 33,074 |
| Patch GWB | 136,600 sf | 0.50 /sf | 68,300 |
| Operable partitions w/writeable surface on one side | 325 sf | 77.00 /sf | 25,025 |
| Operable partitions w/writeable surface on both sides | 2,740 sf | 98.00 /sf | 268,520 |
| *C1010 Partitions* | ***136,600 sf*** | *38.28 /sf* | *5,229,438* |
| **C1020 Interior Doors** | | | |
| Door blocking - interior | 4,965 lf | 13.85 /lf | 68,772 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **C1020 Interior Doors** | | | |
| Install interior door, HW | 300 ea | 300.00 /ea | 90,000 |
| HM doors - interior - flush | 45 lvs | 310.00 /lvs | 13,950 |
| HM frames - interior single | 258 ea | 310.00 /ea | 79,980 |
| HM frames - interior single, tandem | 13 ea | 360.00 /ea | 4,680 |
| HM frames - interior double | 29 ea | 385.00 /ea | 11,165 |
| Wood door - interior flush | 297 lvs | 390.00 /lvs | 115,830 |
| Fire rated wood doors - premium | 44 lvs | 390.00 /lvs | 17,160 |
| Acoustical doors (STC 45) - premium | 1 ls | 15,000.00 /ls | 15,000 |
| Access panels | 1 ls | 15,000.00 /ls | 15,000 |
| Coiling security screen - 4' high, manual | 85 sf | 70.00 /sf | 5,950 |
| Coiling security screen - 8' high, manual | 690 sf | 70.00 /sf | 48,300 |
| Custom security gate @ Learning Commons | 2 lvs | 6,000.00 /lvs | 12,000 |
| Aluminum entrance doors, HW - interior | 1 lvs | 6,000.00 /lvs | 6,000 |
| Aluminum entrance doors, HW - interior, School Guard | 8 lvs | 7,000.00 /lvs | 56,000 |
| Hardware sets - standard interior | 287 set | 1,015.00 /set | 291,305 |
| Hardware sets - interior, tandem | 13 set | 1,330.00 /set | 17,290 |
| Automatic operators | 1 pair | 4,400.00 /pair | 4,400 |
| Door glazing - full | 159 ea | 400.00 /ea | 63,600 |
| Door glazing - narrow | 2 ea | 100.00 /ea | 200 |
| Install HM door frames - interior single | 271 ea | 73.00 /ea | 19,783 |
| Install HM door frames - interior double | 29 ea | 117.00 /ea | 3,393 |
| Paint HM doors - interior | 45 lvs | 90.00 /lvs | 4,050 |
| Paint HM frames - interior, single | 271 ea | 50.00 /ea | 13,550 |
| Paint HM frames - interior, double | 29 ea | 60.00 /ea | 1,740 |
| *C1020 Interior Doors* | ***136,600 sf*** | *7.17 /sf* | *979,098* |
| **C1030 Specialties/Millwork** | | | |
| Guardrails @ Atrium | 380 lf | 500.00 /lf | 190,000 |
| Window sills - P-lam | 1,100 lf | 25.00 /lf | 27,500 |
| Wood louvered shades - Rulon panel grille | 450 lf | 150.00 /lf | 67,500 |
| Mirrors - unframed restroom | 1,145 sf | 35.00 /sf | 40,075 |
| Interior signage | 136,600 sf | 0.35 /sf | 47,810 |
| Toilet partition | 23 ea | 1,020.00 /ea | 23,460 |
| Toilet partition - handicap | 16 ea | 1,650.00 /ea | 26,400 |
| Urinal screens - wall-hung | 15 ea | 433.00 /ea | 6,495 |
| Cubicle curtains | 45 lf | 40.00 /lf | 1,800 |
| Cubicle curtain track | 45 lf | 11.50 /lf | 518 |
| Corner guards | 1 ls | 20,000.00 /ls | 20,000 |
| Toilet paper dispenser | 54 ea | 105.17 /ea | 5,679 |
| Grab bar | 62 ea | 141.38 /ea | 8,765 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **C1030 Specialties/Millwork** | | | |
| Soap dispenser - surface mounted | 59 ea | 87.64 /ea | 5,171 |
| Paper towel dispenser - recessed | 32 ea | 136.79 /ea | 4,377 |
| Framed mirrors | 15 ea | 171.00 /ea | 2,565 |
| Sanitary napkin disposal | 46 ea | 274.00 /ea | 12,604 |
| Shower curtains, hooks & rod | 3 ea | 125.00 /ea | 375 |
| Shower seat | 2 ea | 668.00 /ea | 1,336 |
| Mop rack | 3 ea | 230.67 /ea | 692 |
| Fire extinguisher cabinet - fully recessed | 27 ea | 350.00 /ea | 9,450 |
| Student lockers - phenolic | 660 ea | 600.00 /ea | 396,000 |
| Athletic lockers | 80 ea | 350.00 /ea | 28,000 |
| Staff lockers | 12 ea | 400.00 /ea | 4,800 |
| Locker benches | 12 lf | 55.00 /lf | 660 |
| Misc. specialties - Allowance | 136,600 sf | 0.25 /sf | 34,150 |
| *C1030 Specialties/Millwork* | **136,600** *sf* | *7.07 /sf* | *966,182* |
| **C10 Interior Construction** | **136,600 sf** | **52.52 /sf** | **7,174,718** |
| **C20 Stairs** | | | |
| **C2010 Stair Construction** | | | |
| *Place & finish stair treads/landings* | *BP#2* | */BP#2* | |
| Ornamental stairs 3 and 6 - excluding rails | 2 flt | 60,000.00 /flt | 120,000 |
| Egress stair | 5 flt | 20,000.00 /flt | 100,000 |
| *Ornamental stairs 4 and 5 - excluding rails* | *BP#2* | */BP#2* | |
| Roof ladders | 3 ea | 1,500.00 /ea | 4,500 |
| Guardrails @ Atrium stairs | 235 lf | 500.00 /lf | 117,500 |
| *C2010 Stair Construction* | **136,600** *sf* | *2.50 /sf* | *342,000* |
| **C2020 Stair Finishes** | | | |
| Rubber flooring @ ornamental stairs | 770 sf | 8.00 /sf | 6,160 |
| Paint egress stairs | 5 flt | 2,000.00 /flt | 10,000 |
| *C2020 Stair Finishes* | **136,600** *sf* | *0.12 /sf* | *16,160* |
| **C20 Stairs** | **136,600 sf** | **2.62 /sf** | **358,160** |
| **C30 Interior Finishes** | | | |
| **C3010 Wall Finishes** | | | |
| Lull, laborer for cleanup by Consigli (Tile) | (1) ls | 7,000.00 /ls | (7,000) |
| Trade support - lull, laborer for cleanup (Tile) | 1 ls | 7,000.00 /ls | 7,000 |
| *Brick veneer - interior - N/A* | - | */-* | |
| Miscellaneous wood base/trim | 136,600 sf | 0.50 /sf | 68,300 |
| Trim @ Breakout D glass lights | 320 sf | 25.00 /sf | 8,000 |
| P-lam panel | 1,440 sf | 45.00 /sf | 64,800 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **C3010 Wall Finishes** | | | |
| P-lam panel backsplash | 120 sf | 45.00 /sf | 5,400 |
| Marker tray - bamboo | 2,485 lf | 30.00 /lf | 74,550 |
| MDF bumper rail | 3,715 lf | 25.00 /lf | 92,875 |
| P-lam wall panels - sound reflecting @ Auditorium | 2,925 sf | 45.00 /sf | 131,625 |
| P-lam wall panels - vestibules | 400 sf | 45.00 /sf | 18,000 |
| P-lam projector enclosure @ Auditorium | 1 ea | 2,500.00 /ea | 2,500 |
| Ceramic wall tile | 2,295 sf | 18.00 /sf | 41,310 |
| Quarry tile base | 280 lf | 20.00 /lf | 5,600 |
| Linoleum tile base w/trim | 19,260 lf | 9.00 /lf | 173,340 |
| Rubber base | 2,175 lf | 3.50 /lf | 7,613 |
| Vented base @ Gym | 370 lf | 8.00 /lf | 2,960 |
| Fiberglass reinforced panels (FRP) - wall panels | 2,240 sf | 8.00 /sf | 17,920 |
| Fabric wrapped acoustical panels | 12,275 sf | 20.00 /sf | 245,500 |
| Tectum wall panels | 5,535 sf | 18.00 /sf | 99,630 |
| Mural panorama wall covering | 1,485 sf | 1.50 /sf | 2,228 |
| Paint GWB partitions | 227,710 sf | 0.80 /sf | 182,168 |
| *Paint CMU - N/A* | - | /- | |
| Epoxy wall paint | 15,550 sf | 2.30 /sf | 35,765 |
| Touchup | 136,600 sf | 0.50 /sf | 68,300 |
| Magnetic writeable wall covering | 9,045 sf | 22.00 /sf | 198,990 |
| *C3010 Wall Finishes* | **136,600** *sf* | *11.33 /sf* | *1,547,373* |
| **C3020 Floor Finishes** | | | |
| Lull, laborer for cleanup by Consigli (Resilient) | (1) ls | 48,000.00 /ls | (48,000) |
| Trade support - lull, laborer for cleanup (Resilient) | 1 ls | 48,000.00 /ls | 48,000 |
| Polished concrete @ Auditorium | 3,650 sf | 9.00 /sf | 32,850 |
| Wood base | 100 lf | 25.00 /lf | 2,500 |
| Porcelain floor tile | 5,475 sf | 25.00 /sf | 136,875 |
| Quarry floor tile | 1,770 sf | 20.00 /sf | 35,400 |
| Underlayment at 2nd and 3rd floor linoleum - Forbo NR99, exclude corridors | 62,015 sf | 4.00 /sf | 248,060 |
| *Moisture mitigation - Excluded* | - | /- | |
| Hardwood stage assembly | 1,610 sf | 25.00 /sf | 40,250 |
| Wood athletic flooring | 8,570 sf | 20.00 /sf | 171,400 |
| Linoleum tile | 100,135 sf | 6.00 /sf | 600,810 |
| Epoxy flooring/base | 5,780 sf | 14.00 /sf | 80,920 |
| Carpet @ Auditorium | 135 sy | 45.00 /sy | 6,075 |
| Seal concrete floor | 7,245 sf | 2.00 /sf | 14,490 |
| Entry mats - recessed | 435 sf | 40.00 /sf | 17,400 |
| *C3020 Floor Finishes* | **136,600** *sf* | *10.15 /sf* | *1,387,030* |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **C3030 Ceiling Finishes** | | | |
| Dance floor at auditorium - multi-trade | 1 ls | 75,000.00 /ls | 75,000 |
| Lull, laborer for cleanup by Consigli (Finish Carpentry) | (1) ls | 72,000.00 /ls | (72,000) |
| Lull, laborer for cleanup by Consigli (Ceilings) | (1) ls | 49,000.00 /ls | (49,000) |
| Trade support - lull, laborer for cleanup (Finish Carpentry) | 1 ls | 72,000.00 /ls | 72,000 |
| Trade support - lull, laborer for cleanup (Ceilings) | 1 ls | 49,000.00 /ls | 49,000 |
| P-lam panel on Z-clips @ Breakout | 325 sf | 45.00 /sf | 14,625 |
| Suspended P-lam clouds @ Auditorium | 100 ea | 2,000.00 /ea | 200,000 |
| Gypsum board ceilings | 21,010 sf | 15.25 /sf | 320,411 |
| Gypsum board ceilings - 1 hr | 655 sf | 19.10 /sf | 12,511 |
| Gypsum board ceilings - 2 hr | 80 sf | 22.90 /sf | 1,832 |
| Gypsum board ceilings - resilient | 5,350 sf | 31.75 /sf | 169,863 |
| Stucco soffit | 1,245 sf | 11.35 /sf | 14,131 |
| Gypsum board soffits | 28,335 sf | 25.45 /sf | 721,126 |
| Gypsum board soffits @ Learning Commons | 4,920 sf | 25.45 /sf | 125,214 |
| Gypsum board soffits @ Skylights | 1,915 sf | 25.45 /sf | 48,737 |
| A1 - Armstrong Ultima #1911, random running bond pattern | 21,400 sf | 9.00 /sf | 192,600 |
| A1 - Armstrong Ultima #1911 @ Learning Commons corridors | 9,980 sf | 9.00 /sf | 89,820 |
| A2 - Armstrong Calla #2824 | 20,985 sf | 8.00 /sf | 167,880 |
| A3 - USG Geometrix 3 Dimensional | 3,815 sf | 35.00 /sf | 133,525 |
| A4 - Armstrong Healthzone Ultima | 1,760 sf | 7.00 /sf | 12,320 |
| Paint GWB ceilings | 21,735 sf | 1.00 /sf | 21,735 |
| Paint GWB soffits | 35,170 sf | 1.00 /sf | 35,170 |
| Paint exposed ceilings | 24,085 sf | 1.50 /sf | 36,128 |
| Paint exposed ceilings @ Gym and Auditorium | 14,385 sf | 2.50 /sf | 35,963 |
| *C3030 Ceiling Finishes* | **136,600** *sf* | *17.78 /sf* | *2,428,588* |
| **C30 Interior Finishes** | **136,600 sf** | **39.26 /sf** | **5,362,991** |
| **C Interiors** | **136,600 sf** | **94.41 /sf** | **12,895,869** |
| **D Services** | | | |
| **D10 Conveying Systems** | | | |
| **D1010 Elevators & Lifts** | | | |
| Elevator pit ladders | 1 ea | 450.00 /ea | 450 |
| Passenger elevators - cab, equipment | 1 ls | 40,000.00 /ls | 40,000 |
| Passenger elevators - stops | 4 stop | 45,000.00 /stop | 180,000 |
| *D1010 Elevators & Lifts* | **136,600** *sf* | *1.61 /sf* | *220,450* |
| **D10 Conveying Systems** | **136,600 sf** | **1.61 /sf** | **220,450** |
| **D20 Plumbing** | | | |
| **D2010 Plumbing** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D2010 Plumbing** | | | |
| Lull, laborer for cleanup by Consigli (Plumbing) | (1) ls | 83,000.00 /ls | (83,000) |
| Trade support - lull, laborer for cleanup (Plumbing) | 1 ls | 83,000.00 /ls | 83,000 |
| Water closet/wall mnt./carrier/flush valve | 22 ea | 1,330.12 /ea | 29,263 |
| Water closet/wall mnt./carrier/flush valve/ADA | 32 ea | 1,367.52 /ea | 43,761 |
| Urinal/wall mnt./carrier/flush valve | 18 ea | 1,202.85 /ea | 21,651 |
| Urinal/wall mnt./carrier/flush valve/ADA | 5 ea | 1,241.35 /ea | 6,207 |
| Lavatory/undermount/std 1-lever faucet | 54 ea | 523.24 /ea | 28,255 |
| Lavatory/undermount/std 1-lever faucet/ADA | 10 ea | 586.41 /ea | 5,864 |
| Lavatory/wall hung/std 1-lever faucet/carrier/ADA | 15 ea | 1,147.55 /ea | 17,213 |
| Mixing valve/single lav. (Leonard #170) | 85 ea | 348.84 /ea | 29,651 |
| P15 Sink/lay-in/1-bowl 20"x22"/std faucet/ADA | 2 ea | 1,560.75 /ea | 3,121 |
| P14 Sink/lay-in/1-bowl 20"x22"/std faucet/ADA Maker Space | 2 ea | 1,610.75 /ea | 3,221 |
| P7 Sink/lay-in/1-bowl 21"x15"/std faucet | 36 ea | 1,584.98 /ea | 57,059 |
| P9 Sink/lay-in/1-bowl 21"x15"/std faucet Art Room | 3 ea | 1,384.98 /ea | 4,155 |
| P9A Sink/lay-in/1-bowl 21"x15"/std faucet/ADA Art Room | 1 ea | 1,455.75 /ea | 1,456 |
| P7A Sink/lay-in/1-bowl 21"x15"/std faucet/ADA | 3 ea | 1,860.75 /ea | 5,582 |
| P8 Sinlk/lay-in/1-bowl/22"x16"/bubbler | 5 ea | 1,715.35 /ea | 8,577 |
| P-13 Sink/acid waste/undermount/std 2-lever faucet/ss - 21"x15"x10"D | 3 ea | 1,508.82 /ea | 4,526 |
| - Solids interceptors (Art Room sinks) | 4 ea | 552.64 /ea | 2,211 |
| Mop sink/floor mnt - 24"x24" | 5 ea | 1,349.01 /ea | 6,745 |
| P6 Shower stall/std valve & access./3'x3' fiberglass | 1 ea | 2,704.96 /ea | 2,705 |
| P6-A Shower stall/std valve & access./5'x3' fiberglass/ADA | 2 ea | 3,701.67 /ea | 7,403 |
| P13 Emergency eye wash station/mixing valve/sink mount | 3 ea | 1,106.71 /ea | 3,320 |
| Emergency shower/eye wash sta./mixing valve/cabinet mount | 7 ea | 3,540.35 /ea | 24,782 |
| Water cooler/bi-level/ADA | 10 ea | 4,418.42 /ea | 44,184 |
| - Plumbing fixtures offload & distribution | 239 ea | 103.07 /ea | 24,634 |
| - Plumbing fixtures rough-in | 239 ea | 128.07 /ea | 30,609 |
| *D2010 Plumbing* | ***136,600*** *sf* | *3.05 /sf* | *416,156* |
| **D2020 Domestic Water Distribution** | | | |
| Insulation/copper pipe/fiberglass | 7,975 lf | 8.44 /lf | 67,307 |
| Water meter w/remote readout - 4" | 1 ea | 2,285.75 /ea | 2,286 |
| Water sub-meter - avg. size | 1 ea | 1,561.84 /ea | 1,562 |
| Water sub-meter - 1.5 Circ | 1 ea | 1,261.84 /ea | 1,262 |
| Water sub-meter - 2" Domestic WH | 1 ea | 1,277.30 /ea | 1,277 |
| Backflow preventer/RPZ-BFP - dishwasher | 1 ea | 1,809.21 /ea | 1,809 |
| Backflow preventer/RPZ-BFP - 2" LW | 2 ea | 1,657.68 /ea | 3,315 |
| Backflow preventer/RPZ-BFP - 4" | 1 ea | 1,960.75 /ea | 1,961 |
| Pressure reducing valve/PRV - 1" | 1 ea | 1,159.21 /ea | 1,159 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D2020 Domestic Water Distribution** | | | |
| Pressure reducing valve - 4" | 1 ea | 2,210.75 /ea | 2,211 |
| Recirculation pump/bronze/6.5 gpm - 1/8 hp (B&G Ecocirc) | 1 ea | 1,806.14 /ea | 1,806 |
| Recirculation pump/bronze/10 gpm - 1/6 hp (B&G #SSF-22) | 2 ea | 709.14 /ea | 1,418 |
| Expansion tank/ASME/potable - 9 gal (B&G #PTA-30V) | 1 ea | 1,250.61 /ea | 1,251 |
| TMV/master/hi-lo temp. | 1 ea | 2,759.21 /ea | 2,759 |
| Hose bibbs w/vac. breaker/encased - interior | 19 ea | 382.50 /ea | 7,268 |
| Hose bibbs/exterior/encased (Zurn #Z1320) | 3 ea | 452.07 /ea | 1,356 |
| Trap primers/electronic - 8 outlet (PPP #PT-8) | 8 ea | 1,359.91 /ea | 10,879 |
| Shock absorbers/12 - 33 fixture units (Shoktrol #200) | 3 ea | 269.77 /ea | 809 |
| Valve box/washing machine | 1 ea | 226.54 /ea | 227 |
| Valve box/ice machine | 3 ea | 176.54 /ea | 530 |
| Domestic water entrance UG/ductile iron - 4" | 20 lf | 306.14 /lf | 6,123 |
| Domestic water AG/type "L" copper/press fit ftgs. - avg. size | 525 lf | 23.31 /lf | 12,235 |
| Domestic water AG/type "L" copper/press fit - 1/2" TP | 1,120 lf | 13.02 /lf | 14,577 |
| Domestic water AG/type "L" copper/press fit - 1/2" NP | 800 lf | 13.02 /lf | 10,412 |
| Domestic water AG/type "L" copper/press fit - 1/2" | 1,460 lf | 13.02 /lf | 19,002 |
| Domestic water AG/type "L" copper/press fit - 3/4" NP | 450 lf | 15.76 /lf | 7,091 |
| Domestic water AG/type "L" copper/press fit - 3/4" | 1,240 lf | 15.76 /lf | 19,539 |
| Domestic water AG/type "L" copper/press fit - 1" NP | 100 lf | 20.56 /lf | 2,056 |
| Domestic water AG/type "L" copper/press fit - 1" | 50 lf | 20.57 /lf | 1,028 |
| Domestic water AG/type "L" copper/press fit - 1-1/4" NP | 100 lf | 25.23 /lf | 2,523 |
| Domestic water AG/type "L" copper/press fit - 1-1/4" | 115 lf | 25.23 /lf | 2,902 |
| Domestic water AG/type "L" copper/press fit - 1-1/2" | 400 lf | 30.31 /lf | 12,125 |
| Domestic water AG/type "L" copper/press fit - 2" NP | 450 lf | 41.16 /lf | 18,523 |
| Domestic water AG/type "L" copper/press fit - 2" | 300 lf | 41.16 /lf | 12,349 |
| Domestic water AG/type "L" copper/press fit - 2-1/2" | 285 lf | 66.38 /lf | 18,919 |
| Domestic water AG/type "L" copper/press fit - 3" | 480 lf | 84.91 /lf | 40,759 |
| Domestic water AG/type "L" copper/press fit - 4" | 100 lf | 116.00 /lf | 11,600 |
| Non-potable water AG/type "L" copper/solder - Hood Tie In | 60 lf | 22.94 /lf | 1,377 |
| - Domestic water piping accessories DOM | 6,095 lf | 2.78 /lf | 16,917 |
| - Domestic water piping accessories NP | 1,900 lf | 2.78 /lf | 5,274 |
| - Domestic water heat tracing/small bore piping All LHW | 1,900 lf | 25.97 /lf | 49,340 |
| - Domestic water pipe & equipment I.D. DOM | 6,095 lf | 1.61 /lf | 9,817 |
| - Domestic water pipe & equipment I.D. NP | 1,900 lf | 1.52 /lf | 2,881 |
| - Domestic water pressure gauges & thermometers | 12 ea | 120.61 /ea | 1,447 |
| - Domestic water support steel/additional to hangers & clamps | 1 ls | 1,074.56 /ls | 1,075 |
| - Layout Mech Room | 1 ls | 20,000.00 /ls | 20,000 |
| - Domestic water storage tank | 1 ls | 3.52 /ls | 4 |
| Domestic Boilers/gas fired/399 mbh (AO Smith #BTH-300A) | 2 ea | 15,618.42 /ea | 31,237 |
| Boiler Flues | 1 ls | 45,525.00 /ls | 45,525 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D2020 Domestic Water Distribution** | | | |
| Water Heater Flues | 1 ls | 24,000.00 /ls | 24,000 |
| HWH/indirect fed - 300 gal | 1 ea | 7,418.42 /ea | 7,418 |
| *D2020 Domestic Water Distribution* | **136,600** *sf* | *3.96 /sf* | *540,525* |
| **D2030 Sanitary Waste** | | | |
| Floor drain - 3" (#ZN415-6B) | 16 ea | 294.07 /ea | 4,705 |
| Floor drain - 4" (#ZN415-8B) | 4 ea | 353.07 /ea | 1,412 |
| Floor sink/12x12 - 4" (#Z1900) | 8 ea | 2,581.14 /ea | 20,649 |
| Floor cleanouts - 4" (#ZN1400) | 37 ea | 291.07 /ea | 10,770 |
| Wall cleanouts - 4" (#Z1468) | 10 ea | 101.08 /ea | 1,011 |
| Grease interceptor/interior/size 800/75 gpm/150 gal. | 2 ea | 4,291.56 /ea | 8,583 |
| 8000 Gallon Concrete Grease Trap | 1 ea | 17,649.12 /ea | 17,649 |
| Elevator sump pump/oil minder | 1 ea | 3,812.28 /ea | 3,812 |
| Grease interceptor flow control | 1 ea | 417.14 /ea | 417 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 2" | 220 lf | 31.98 /lf | 7,036 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 3" | 236 lf | 36.45 /lf | 8,602 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 4" | 610 lf | 44.78 /lf | 27,315 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 6" | 275 lf | 74.82 /lf | 20,576 |
| Sanitary AG/cast iron no hub pipe & ftgs. - avg. size Fixture Runouts | 1,560 lf | 47.33 /lf | 73,828 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 1-1/2" | 30 lf | 33.82 /lf | 1,015 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 2" | 750 lf | 34.83 /lf | 26,119 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 3" | 980 lf | 44.36 /lf | 43,468 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 4" | 495 lf | 52.52 /lf | 25,999 |
| Grease waste UG/cast iron single hub pipe & ftgs. - 2" | 40 lf | 31.98 /lf | 1,279 |
| Grease waste UG/cast iron single hub pipe & ftgs. - 3" | 20 lf | 36.45 /lf | 729 |
| Grease waste UG/cast iron single hub pipe & ftgs. - 4" | 220 lf | 44.78 /lf | 9,851 |
| Grease waste AG/cast iron no hub pipe & ftgs. - 2" | 55 lf | 34.83 /lf | 1,915 |
| Grease waste AG/cast iron no hub pipe & ftgs. - 3" | 65 lf | 44.36 /lf | 2,883 |
| Grease waste AG/cast iron no hub pipe & ftgs. - 4" | 70 lf | 52.52 /lf | 3,677 |
| - Sanitary waste & vent piping accessories | 5,626 lf | 1.77 /lf | 9,976 |
| - Sanitary piping & equipment I.D. | 5,626 lf | 1.81 /lf | 10,171 |
| *D2030 Sanitary Waste* | **136,600** *sf* | *2.51 /sf* | *343,448* |
| **D2040 Rain Water Drainage** | | | |
| Insulation/rainleader pipe/fiberglass/PVC jacketed/horiz. & vert. | 1,200 lf | 40.61 /lf | 48,737 |
| Roof drain/#ZC100 - 4" | 9 ea | 298.07 /ea | 2,683 |
| Roof drain/#ZC100 - 5" | 2 ea | 387.84 /ea | 776 |
| Roof drain/#ZC100 - 6" | 14 ea | 387.84 /ea | 5,430 |
| Floor cleanouts - 4" (#ZN1400) | 6 ea | 291.07 /ea | 1,746 |
| Wall cleanouts - 4" (#Z1468) | 12 ea | 101.07 /ea | 1,213 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 4" | 90 lf | 44.77 /lf | 4,030 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D2040 Rain Water Drainage** | | | |
| Rainleader UG/cast iron single hub pipe & ftgs. - 6" | 90 lf | 74.82 /lf | 6,734 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 8" | 70 lf | 103.25 /lf | 7,228 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 10" | 160 lf | 141.04 /lf | 22,566 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 12" | 25 lf | 186.99 /lf | 4,675 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 4" | 265 lf | 52.53 /lf | 13,919 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 6" | 410 lf | 81.16 /lf | 33,274 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 8" | 460 lf | 133.84 /lf | 61,565 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 10" | 10 lf | 198.47 /lf | 1,985 |
| - Rainleader piping accessories | 1,580 lf | 1.77 /lf | 2,802 |
| - Rainleader piping & equipment I.D. | 1,580 lf | 1.46 /lf | 2,314 |
| *D2040 Rain Water Drainage* | ***136,600 sf*** | *1.62 /sf* | *221,676* |
| **D2090 Other Plumbing Systems** | | | |
| General requirements (management, permits, as-builts, coring, fire stopping) | 136,600 sf | 0.75 /sf | 102,450 |
| 3D/BIM coordination | 1 ls | 12,000.00 /ls | 12,000 |
| Core drilling | 1 ls | 10,000.00 /ls | 10,000 |
| Project management | 1 ls | 50,000.00 /ls | 50,000 |
| Kitchen Equipment Tie ins | 1 ls | 12,000.00 /ls | 12,000 |
| Commissioning support/day | 5 day | 824.56 /day | 4,123 |
| Gas Flow Meter - avg. size | 1 ea | 1,857.68 /ea | 1,858 |
| Emergency gas shut off/cabinet w/1" solonoid & UL ball valve 1114, 1111A | 2 ea | 3,968.42 /ea | 7,937 |
| Emergency gas shut off/cabinet w/1-1/2" solonoid & UL ball valve KIT | 1 ea | 5,093.42 /ea | 5,093 |
| - Remote panic buttons | 2 ea | 828.07 /ea | 1,656 |
| Gas turret/single | 5 ea | 212.07 /ea | 1,060 |
| Gas turret/double | 5 ea | 320.54 /ea | 1,603 |
| Gas piping/sch 40 black steel CW t&c - 1" | 240 lf | 28.68 /lf | 6,882 |
| Gas piping/sch 40 black steel CW t&c - 1-1/4" | 120 lf | 34.14 /lf | 4,097 |
| Gas piping/sch 40 black steel CW t&c - 1-1/2" | 65 lf | 37.25 /lf | 2,421 |
| Gas piping/sch 40 black steel CW t&c - 2" | 10 lf | 42.28 /lf | 423 |
| Gas piping/sch 40 blk stl ERW weld - 2-1/2" | 30 lf | 45.73 /lf | 1,372 |
| Gas piping/sch 40 blk stl ERW weld - 3" | 75 lf | 54.12 /lf | 4,059 |
| Gas piping/sch 40 blk stl ERW weld - 4" | 60 lf | 87.71 /lf | 5,263 |
| Gas piping/sch 40 blk stl ERW weld - 8" | 25 lf | 180.43 /lf | 4,511 |
| - Gas piping accessories | 625 lf | 2.52 /lf | 1,577 |
| - Gas piping link seals | 1 ea | 404.61 /ea | 405 |
| - Gas piping & equipment I.D. | 625 lf | 28.95 /lf | 18,094 |
| Acid neut. Tank/5 gallon - 1-sink (Orion style 5) | 1 ea | 622.14 /ea | 622 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D2090 Other Plumbing Systems** | | | |
| Acid neut. tank/15 gallon - 3-sinks (Orion style 5) | 3 ea | 911.21 /ea | 2,734 |
| Acid neut. tank/55 gallon - | 2 ea | 1,912.28 /ea | 3,825 |
| - Limestone chips/50 lb. bag | 24 ea | 43.77 /ea | 1,050 |
| PH Monitoring (2) locations | 2 ea | 6,612.28 /ea | 13,225 |
| Floor drain - 6" (#ZN415-AA-8B) | 3 ea | 480.84 /ea | 1,443 |
| Floor cleanout/heavy duty - 4" (#ZN1400-K-AR) | 5 ea | 424.84 /ea | 2,124 |
| Wall cleanouts/#Z1468 - 4" | 5 ea | 101.07 /ea | 505 |
| Acid waste UG/sch 40 polypropylene fuseal & ftgs. - 3" | 20 lf | 58.29 /lf | 1,166 |
| Acid waste UG/sch 40 polypropylene fuseal & ftgs. - 4" | 230 lf | 68.91 /lf | 15,849 |
| Tie-ins to Lab Hoods acid waste & vent - A/G | 3 ea | 815.35 /ea | 2,446 |
| Acid waste AG/sch 40 polypropylene fuseal & ftgs. - 2" | 800 lf | 51.44 /lf | 41,154 |
| Acid waste AG/sch 40 polypropylene fuseal & ftgs. - 3" | 400 lf | 65.67 /lf | 26,269 |
| Acid waste AG/sch 40 polypropylene fuseal & ftgs. - 4" | 360 lf | 77.44 /lf | 27,877 |
| - Acid waste & vent piping accessories | 1,790 lf | 2.02 /lf | 3,622 |
| - Acid waste piping & equipment I.D. | 1,790 lf | 2.56 /lf | 4,585 |
| Wiring PH Monitor and Misc Control | 1 ls | 6,000.00 /ls | 6,000 |
| SM - Flue piping/double wall/stainless steel/6" pipe - linear foot DWH | 600 lf | 97.98 /lf | 58,786 |
| SM - Flue piping/double wall/stainless steel/6" fittings - each DWH | 16 ea | 122.47 /ea | 1,960 |
| SM - Flue piping/double wall/stainless steel/6" fittings - each DWH | 8 lf | 122.47 /lf | 980 |
| *D2090 Other Plumbing Systems* | **136,600** *sf* | *3.48 /sf* | *475,103* |
| **D20 Plumbing** | **136,600 sf** | **14.62 /sf** | **1,996,907** |
| **D30 Heating, Ventilating, and Air Conditioning (HVAC)** | | | |
| **D3010 Energy Supply** | | | |
| Insulation/pipe/copper | 14,483 lf | 7.09 /lf | 102,715 |
| Insulation/pipe/weld | 3,838 lf | 12.50 /lf | 47,975 |
| Hot water s&r/type "L" copper solder - 3/4" | 8,970 lf | 20.16 /lf | 180,835 |
| Hot water s&r/type "L" copper solder - 1" | 1,760 lf | 25.01 /lf | 44,018 |
| Hot water s&r/type "L" copper solder - 1-1/4" | 1,260 lf | 28.57 /lf | 35,998 |
| Hot water s&r/type "L" copper solder - 1-1/2" | 890 lf | 32.82 /lf | 29,210 |
| Hot water s&r/type "L" copper solder - 2" | 1,550 lf | 41.25 /lf | 63,937 |
| Hot water s&r/sch 40 blk stl ERW weld - 2-1/2" | 605 lf | 50.55 /lf | 30,583 |
| Hot water s&r/sch 40 blk stl ERW weld - 3" | 475 lf | 59.42 /lf | 28,225 |
| Hot water s&r/sch 40 blk stl ERW weld - 4" | 756 lf | 82.30 /lf | 62,219 |
| Hot water s&r/sch 40 blk stl ERW weld - 6" | 520 lf | 134.07 /lf | 69,716 |
| Hot water s&r/sch 40 blk stl ERW weld - 8" | 220 lf | 167.74 /lf | 36,903 |
| Glycol water s&r/type "L" copper solder - 2" | 53 lf | 41.25 /lf | 2,186 |
| Glycol water s&r/sch 40 blk stl ERW weld - 2-1/2" | 47 lf | 50.55 /lf | 2,376 |
| Glycol water s&r/sch 40 blk stl ERW weld - 3" | 90 lf | 59.42 /lf | 5,348 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D3010 Energy Supply** | | | |
| Glycol water s&r/sch 40 blk stl ERW weld - 4" | 152 lf | 82.30 /lf | 12,510 |
| Glycol water s&r/sch 40 blk stl ERW weld - 6" | 910 lf | 134.07 /lf | 122,004 |
| Glycol water s&r/sch 40 blk stl ERW weld - 8" | 110 lf | 167.74 /lf | 18,451 |
| - Hydronic piping accessories | 18,368 lf | 2.53 /lf | 46,506 |
| Pump/base mount/790 gpm (HW) | 2 ea | 8,167.68 /ea | 16,335 |
| Chilled water pump house (pumps & accesories, enclosure, piping, unit heater | 1 ls | 226,667.68 /ls | 226,668 |
| - Suction diffusers | 2 ea | 1,460.58 /ea | 2,921 |
| - Flex connector/HVAC pumps | 4 ea | 556.35 /ea | 2,225 |
| - Triple duty valves | 2 ea | 2,312.69 /ea | 4,625 |
| Air separators | 1 ea | 4,333.84 /ea | 4,334 |
| Expansion tanks/ASME | 2 ea | 7,167.68 /ea | 14,335 |
| Chemical treatment (lump sum) | 1 ls | 20,000.00 /ls | 20,000 |
| Glycol feed/50 gal. tank w/pump (Neptune #G-50-1) | 2 ea | 5,272.92 /ea | 10,546 |
| - Glycol solution/40% propylene | 1,000 gal | 25.21 /gal | 25,212 |
| *D3010 Energy Supply* | **136,600** *sf* | *9.29 /sf* | *1,268,916* |
| **D3020 HVAC** | | | |
| Boiler/HW/gas/high eff. cond. - 4,000 mbh Riello AR 4000 | 2 ea | 57,501.52 /ea | 115,003 |
| Boiler circulator pump | 2 ea | 1,708.46 /ea | 3,417 |
| Boiler combustion air/galvanized steel 10" | 200 lf | 38.00 /lf | 7,600 |
| Flue piping/double wall/stainless steel 10" | 205 lf | 185.00 /lf | 37,925 |
| *D3020 HVAC* | **136,600** *sf* | *1.20 /sf* | *163,945* |
| **D3030 Cooling Generating Systems** | | | |
| Chiller/air cooled - 370 tons | 1 ea | 381,153.80 /ea | 381,154 |
| Buffer tanks/Lochinvar - 300 gals. | 1 ea | 8,750.76 /ea | 8,751 |
| *D3030 Cooling Generating Systems* | **136,600** *sf* | *2.85 /sf* | *389,905* |
| **D3040 HVAC Distribution** | | | |
| Lull, laborer for cleanup by Consigli (HVAC) | (1) ls | 343,000.00 /ls | (343,000) |
| Trade support - lull, laborer for cleanup (HVAC) | 1 ls | 343,000.00 /ls | 343,000 |
| Insulation/ductwork/blanket wrap | 83,500 sf | 3.55 /sf | 296,088 |
| Insulation/ductwork/weatherproof exposed | 4,500 sf | 12.89 /sf | 57,986 |
| Sheetmetal & accessories/galvanized | 101,200 lb | 11.04 /lb | 1,117,248 |
| Sheetmetal & accessories/galvanized (perforated) | 790 lb | 14.49 /lb | 11,447 |
| Sheetmetal & accessories/galvanized (smoke exhasut) | 8,850 lb | 11.04 /lb | 97,704 |
| Sheetmetal & accessories/stainless steel (dishwasher) | 350 lb | 22.28 /lb | 7,798 |
| Sheetmetal & accessories/welded stainless steel (kitchen exhaust) | 1,060 lb | 29.78 /lb | 31,567 |
| Sheetmetal & accessories/welded stainless steel (kiln exhaust) | 500 lb | 29.78 /lb | 14,890 |
| Sheetmetal & accessories/welded stainless steel (3 - fume hoods) | 2,700 lb | 29.78 /lb | 80,406 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D3040 HVAC Distribution** | | | |
| Sheetmetal & accessories/fabric/1-row cable (DuctSox) - 20" | 405 lf | 76.50 /lf | 30,982 |
| Sheetmetal & accessories/fabric/1-row cable (DuctSox) - 24" | 305 lf | 81.29 /lf | 24,792 |
| Duct enclosure (roof) | 1 ea | 5,424.10 /ea | 5,424 |
| SM - Diffusers, registers & grilles | 136,600 sf | 0.20 /sf | 27,320 |
| SM - Linear slot diffusers (supply) | 6 ea | 465.39 /ea | 2,792 |
| *SM - Linear slot diffusers (exhaust) - architectural* | *lf* | */lf* | |
| SM - Displ. Diffuser/Floor Mnt. | 156 ea | 1,289.88 /ea | 201,221 |
| SM - Combination fire/smoke dampers/louver type/UL | 20 ea | 776.53 /ea | 15,530 |
| SM - Motorized damper | 14 ea | 1,107.92 /ea | 15,511 |
| SM - Smoke detectors/duct mount | 40 ea | 747.47 /ea | 29,899 |
| SM - Sound attenuators/in-line/std. gauge | 239,000 cfm | 0.55 /cfm | 131,341 |
| SM - Kitchen exhaust hood/st. steel/install only (by KES) | 1 ea | 2,339.28 /ea | 2,339 |
| SM - Dishwasher exhaust hood/st. steel/install only (by KES) | 1 ea | 1,559.52 /ea | 1,560 |
| SEF-1-4 | 4 ea | 17,339.28 /ea | 69,357 |
| EF-3&4 /centrifugal downblast/roof/direct drive - 500 cfm | 2 ea | 1,069.31 /ea | 2,139 |
| EF-1&2 /centrifugal downblast/roof/direct drive - 2,500 cfm | 2 ea | 1,771.24 /ea | 3,542 |
| KEF-1&2/centrifugal upblast/roof | 2 ea | 2,734.82 /ea | 5,470 |
| FEF-1,2,3,4,5 Lab exhaust fan/roof - 1,200 cfm | 5 ea | 9,084.82 /ea | 45,424 |
| *D3040 HVAC Distribution* | **136,600** *sf* | *17.06 /sf* | *2,329,778* |
| **D3050 Terminal & Package Units** | | | |
| Variable air volume box - small | 12 ea | 533.15 /ea | 6,398 |
| Variable air volume box - medium | 143 ea | 668.62 /ea | 95,612 |
| RTU-1-4 Classrooms (service enclosure, HW&CHW coils, energy recovery) | 80,000 cfm | 15.75 /cfm | 1,260,000 |
| RTU-5 Gymnasium (service enclosure, HW&CHW coils, energy recovery) | 15,000 cfm | 16.25 /cfm | 243,750 |
| RTU-6 Auditorium (service enclosure, HW&CHW coils, energy recovery) | 12,000 cfm | 16.25 /cfm | 195,000 |
| RTU-7 Lockers (service enclosure, HW&CHW coils, energy recovery) | 2,000 cfm | 18.25 /cfm | 36,500 |
| MAU-1 Make-up air unit/HW&CHW coil/ | 5,000 cfm | 7.25 /cfm | 36,250 |
| Mini-split AC system/1-zone/wall mnt./cool only - 12 mbh | 1 ea | 2,072.92 /ea | 2,073 |
| Mini-split AC system/1-zone/wall mnt./cool only - 18 mbh | 5 ea | 2,681.66 /ea | 13,408 |
| Mini-split AC system/1-zone/wall mnt./cool only - 24 mbh | 2 ea | 2,956.03 /ea | 5,912 |
| Mini-split refrigeration line set/6-12 mbh - 50' | 2 ea | 584.88 /ea | 1,170 |
| Mini-split refrigeration line set/15-18 mbh - 50' | 10 ea | 599.88 /ea | 5,999 |
| Mini-split refrigeration line set/24-30 mbh - 50' | 4 ea | 614.88 /ea | 2,460 |
| Mini-split condensate drains/type"L" copper | 450 lf | 19.43 /lf | 8,744 |
| A/C cond. pump | 8 ea | 253.74 /ea | 2,030 |
| INS - Mini-split Insulation/copper pipe | 450 lf | 6.87 /lf | 3,090 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D3050 Terminal & Package Units** | | | |
| ATC - Mini-split condensing units (w/factory controls) | 8 ea | 879.76 /ea | 7,038 |
| ATC - Mini-split indoor units (w/factory controls) | 8 ea | 587.35 /ea | 4,699 |
| Radiant ceiling panels/24" wide - ft. | 1,450 lf | 120.00 /lf | 174,000 |
| FTR-2 Finned-tube radiation w/enclosure - 1 row | 260 lf | 194.24 /lf | 50,502 |
| FTR-1 Finned-tube radiation w/enclosure - 2 row | 570 lf | 259.37 /lf | 147,841 |
| FTR-3 Finned-tube radiation w/enclosure - 2 row | 40 lf | 297.49 /lf | 11,900 |
| Fin-tube radiation/electric - 2 kW | 8 ea | 739.88 /ea | 5,919 |
| Cabinet unit heater/hot water/wall mount/recessed - avg. size | 4 ea | 1,573.62 /ea | 6,294 |
| Cabinet unit heater/hot water/ceiling mount - avg. size | 10 ea | 1,749.51 /ea | 17,495 |
| Unit heater/hot water/horiz./propeller - avg. size | 2 ea | 1,092.41 /ea | 2,185 |
| Misc. VFD's | 1 ls | 35,000.00 /ls | 35,000 |
| VFD w/keypad/disconnect/bypass/NEMA 1 - HW pumps | 2 ea | 6,028.47 /ea | 12,057 |
| *VFD w/keypad/disconnect/bypass/NEMA 1 - CHW pumps w/ pump house* | *ea* | */ea* | |
| *D3050 Terminal & Package Units* | **136,600** *sf* | *17.52 /sf* | *2,393,325* |
| **D3060 HVAC Instrumentation & Controls** | | | |
| Automatic temperature controls/cost per sq. ft. | 136,600 sf | 0.25 /sf | 34,150 |
| ATC - Air valve/hood exhaust/HEX | 3 ea | 4,194.32 /ea | 12,583 |
| ATC - Air valves/no coil control wiring - 3 pts./fume hood | 9 pnt | 437.00 /pnt | 3,933 |
| ATC - RTU's/custom - 30 pts. | 240 pnt | 1,303.18 /pnt | 312,763 |
| ATC - MUA units - 10 pts. | 10 pnt | 759.44 /pnt | 7,594 |
| ATC - Exhaust fans - 3 pts. | 18 pnt | 711.10 /pnt | 12,800 |
| ATC - Life safty fans - 8 pts. | 32 pnt | 766.15 /pnt | 24,517 |
| ATC - Lab exhaust fans - 5 pts./fan | 25 pnt | 766.15 /pnt | 19,154 |
| ATC - Boilers/modular - 10 pts. | 20 pnt | 821.19 /pnt | 16,424 |
| ATC - Pumps - 4 pts. | 16 pnt | 766.15 /pnt | 12,258 |
| ATC - VFD wiring for pumps (remote mount) - 4 pts. | 16 pnt | 763.91 /pnt | 12,223 |
| ATC - Circulators - 2 pts. | 4 pnt | 488.68 /pnt | 1,955 |
| ATC - Chillers - 15 pts. | 15 pnt | 1,303.18 /pnt | 19,548 |
| ATC - VAV box/no coil (ATC furn./factory install controls) 2 pts. | 310 pnt | 408.36 /pnt | 126,592 |
| ATC - Fintube radiation zones - 2 pts. | 20 pnt | 381.96 /pnt | 7,639 |
| ATC - electric fintube radiation zones - 2 pts. | 4 pnt | 381.95 /pnt | 1,528 |
| ATC - Cabinet unit heaters - 3 pts. | 42 pnt | 381.96 /pnt | 16,042 |
| ATC - Unit heaters - 3 pts. | 6 pnt | 381.95 /pnt | 2,292 |
| ATC - Radiant ceiling panel zones - 2 pts. | 246 pnt | 381.96 /pnt | 93,961 |
| ATC - Plumbing points - 10 pts. | 10 pnt | 595.50 /pnt | 5,955 |
| ATC - Elctrical points - 10 pts. | 10 pnt | 595.50 /pnt | 5,955 |
| *D3060 HVAC Instrumentation & Controls* | **136,600** *sf* | *5.49 /sf* | *749,864* |
| **D3070 Testing, Adjusting & Balancing** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D3070 Testing, Adjusting & Balancing** | | | |
| Testing & balancing/cost per sq. ft. | 136,600 sf | 0.65 /sf | 88,790 |
| *D3070 Testing, Adjusting & Balancing* | ***136,600 sf*** | *0.65 /sf* | *88,790* |
| **D3090 Other HVAC Systems & Equipment** | | | |
| General requirements (sq. ft.) | 136,600 sf | 1.15 /sf | 157,090 |
| 3D/BIM coordination | 1 ls | 100,000.00 /ls | 100,000 |
| Commissioning support/lump sum | 1 ls | 15,000.00 /ls | 15,000 |
| Dust collection system | 1 ea | 17,339.28 /ea | 17,339 |
| Kiln exhaust | 1 ls | 5,500.00 /ls | 5,500 |
| Equipment hoisting/rigging/setting/start-up | 136,600 sf | 1.50 /sf | 204,900 |
| *D3090 Other HVAC Systems & Equipment* | ***136,600 sf*** | *3.66 /sf* | *499,829* |
| **D30 Heating, Ventilating, and Air Conditioning (HVAC)** | **136,600 sf** | **57.72 /sf** | **7,884,351** |
| **D40 Fire Protection Systems** | | | |
| **D4010 Sprinklers** | | | |
| Lull, laborer for cleanup by Consigli (Fire Protection) | (1) ls | 31,000.00 /ls | (31,000) |
| Trade support - lull, laborer for cleanup (Fire Protection) | 1 ls | 31,000.00 /ls | 31,000 |
| General requirements (management/design, permits, as-builts, coring, fire stopping) | 136,600 sf | 0.80 /sf | 109,280 |
| Fire dept. inlet connection - 2-1/2" polished brass - 3 -way | 1 ea | 1,863.93 /ea | 1,864 |
| Sprinkler head - wet - recessed pendant | 903 ea | 125.42 /ea | 113,250 |
| Sprinkler head - wet - pendant or upright | 522 ea | 77.23 /ea | 40,313 |
| Sprinkler head - wet - sidewall | 151 ea | 87.51 /ea | 13,213 |
| Sprinkler head - wet - window | 34 ea | 87.51 /ea | 2,975 |
| Sprinkler head - extended coverage pendant or upright | 120 ea | 127.23 /ea | 15,267 |
| Sprinkler head - dry - sidewall (wet system) | 22 ea | 293.06 /ea | 6,447 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 1" | 3,465 lf | 23.99 /lf | 83,116 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 1-1/4" | 600 lf | 27.93 /lf | 16,757 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 1-1/2" | 5,200 lf | 30.66 /lf | 159,417 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 2" | 650 lf | 34.57 /lf | 22,468 |
| Sprinkler main piping black steel sch. 40 w/ fittings (avg. size) | 1,000 lf | 62.18 /lf | 62,184 |
| Sprinkler main piping black steel sch. 10 w/ fittings 3" | 450 lf | 36.32 /lf | 16,345 |
| Sprinkler main piping black steel sch. 10 w/ fittings 4" | 3,180 lf | 39.66 /lf | 126,127 |
| Sprinkler main piping black steel sch. 10 w/ fittings 6" | 500 lf | 69.39 /lf | 34,695 |
| Wet alarm valve - 6" | 1 ea | 3,656.71 /ea | 3,657 |
| Double check valve (BFP) assembly - 6" | 1 ea | 8,244.56 /ea | 8,245 |
| Butterfly valve - 6" | 2 ea | 1,566.71 /ea | 3,133 |
| Zone flow control valve - 4" | 7 ea | 2,521.71 /ea | 17,652 |
| Waterflow switch | 8 ea | 421.96 /ea | 3,376 |
| Tamper switch | 8 ea | 356.96 /ea | 2,856 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D4010 Sprinklers** | | | |
| Water motor gong bell | 1 ea | 628.36 /ea | 628 |
| *D4010 Sprinklers* | **136,600** *sf* | *6.32 /sf* | *863,266* |
| **D4020 Standpipes** | | | |
| Standpipe - sch 40 black steel piping w/ fittings - 6" | 125 lf | 99.13 /lf | 12,391 |
| Drain riser - sch 40 black steel piping w/ fittings - 3" | 125 lf | 49.66 /lf | 6,208 |
| Fire hose valve - 2-1/2" | 12 ea | 353.36 /ea | 4,240 |
| *D4020 Standpipes* | **136,600** *sf* | *0.17 /sf* | *22,839* |
| **D4030 Fire Protection Specialties** | | | |
| Fire valve cabinet - steel - recessed | 12 ea | 894.50 /ea | 10,734 |
| *D4030 Fire Protection Specialties* | **136,600** *sf* | *0.08 /sf* | *10,734* |
| **D4090 Other Fire Protection Systems** | | | |
| Hydraulic calculation & shop drawings | 1 ls | 8,000.00 /ls | 8,000 |
| 3D/BIM coordination | 1 ls | 10,000.00 /ls | 10,000 |
| *D4090 Other Fire Protection Systems* | **136,600** *sf* | *0.13 /sf* | *18,000* |
| **D40 Fire Protection Systems** | **136,600 sf** | **6.70 /sf** | **914,839** |
| **D50 Electrical Systems** | | | |
| **D5010 Gear & Distribution** | | | |
| Feeder (MC) - 20A (kitchen equipment - x42) | 3,150 lf | 5.75 /lf | 18,111 |
| Feeder (MC) - 30A (kitchen equipment - x2) | 200 lf | 5.87 /lf | 1,173 |
| 1" PVC - 30A (3#8 & #10G) | 250 lf | 10.29 /lf | 2,573 |
| Feeder (MC) - 40A (kitchen equipment - x1) | 100 lf | 7.01 /lf | 701 |
| Feeder (MC) - 60A (kitchen equipment - x2) | 200 lf | 10.55 /lf | 2,110 |
| Power for automatic temperature control panels (BMS) | 12 ea | 460.91 /ea | 5,531 |
| Electric heat trace power (cables, sensors, controllers by Div. 21 / 22) | 1,900 lf | 3.50 /lf | 6,650 |
| Service switch: 20A/3P, NEMA-1 | 1 ea | 107.43 /ea | 107 |
| Fused Disco: 20A/3P, NEMA-1 | 7 ea | 323.22 /ea | 2,263 |
| Fused Disco: 100A/3P, NEMA-1 | 2 ea | 1,185.41 /ea | 2,371 |
| Fused Disco: 200A/3P, NEMA-1 | 3 ea | 1,555.38 /ea | 4,666 |
| Fused Disco: 1000A/3P, NEMA-1 | 2 ea | 7,290.94 /ea | 14,582 |
| Wire gymnasum equipment SMC control stations (furnished by others) | 8 ea | 1,058.23 /ea | 8,466 |
| Wire motors and controllers | 15 ea | 821.28 /ea | 12,319 |
| Kitchen equipment final connections (includes flexible whip) | 47 ea | 72.36 /ea | 3,401 |
| Mount & wire VFD's (furnished by Div. 23) | 8 ea | 646.55 /ea | 5,172 |
| MAU (5000cfm) - circuit / disconnect (3R) / connection | 1 ea | 2,503.41 /ea | 2,503 |
| RTU's - circuit / disconnect (3R) / connection (small) | 3 ea | 4,736.19 /ea | 14,209 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5010 Gear & Distribution** | | | |
| RTU's - circuit / disconnect (3R) / connection (large) | 4 ea | 7,010.29 /ea | 28,041 |
| Mini-split systems (indoor/outdoor) - circuits / disconnects (3R) / connections | 8 ea | 3,225.23 /ea | 25,802 |
| Chiller (370T) - circuit / disconnect (3R) / connection | 1 ea | 25,825.56 /ea | 25,826 |
| Smoke exhaust fans - circuit / disconnect / connection (100A) | 4 ea | 2,400.01 /ea | 9,600 |
| Kitchen exhaust fans - circuit / disconnect / connection | 2 ea | 1,420.91 /ea | 2,842 |
| Kiln exhaust system - circuit / disconnect / connection | 1 ea | 2,655.30 /ea | 2,655 |
| Dust collection system - circuit / disconnect / connection | 1 ea | 3,579.00 /ea | 3,579 |
| Fume hood exhaust fans - circuit / disconnect / connection | 5 ea | 1,214.10 /ea | 6,071 |
| Exhaust fans - circuit / disconnect / connection | 4 ea | 1,214.11 /ea | 4,856 |
| Power to electronic trap primers - 120V | 8 ea | 100.19 /ea | 801 |
| Hot water pumps - circuit / disconnect / connection | 2 ea | 1,673.87 /ea | 3,348 |
| Boilers - circuit / disconnect / connection | 2 ea | 1,204.71 /ea | 2,409 |
| Chilled water pump house pumps & heaters - circuits / disconnects / connections | 1 ls | 6,158.00 /ls | 6,158 |
| Hot water heater - circuit / service switch / connection | 1 ea | 591.53 /ea | 592 |
| Cabinet unit heaters - circuit / service switch / connection | 14 ea | 868.28 /ea | 12,156 |
| Unit heaters - circuit / service switch / connection | 2 ea | 868.28 /ea | 1,737 |
| Elevator sump pump - circuit / disconnect (3R) / connection | 1 ea | 1,247.28 /ea | 1,247 |
| Domestic boilers - circuit / disconnect (3R) / connection | 2 ea | 1,247.28 /ea | 2,495 |
| Recirculation pumps - circuit / disconnect / connection | 3 ea | 997.87 /ea | 2,994 |
| Glycol feed pumps - circuit / disconnect / connection | 2 ea | 997.87 /ea | 1,996 |
| Boiler circulation pumps - circuit / disconnect / connection | 2 ea | 997.87 /ea | 1,996 |
| Fin-tube radiators (2kW) - circuit / disconnect / connection | 8 ea | 1,847.40 /ea | 14,779 |
| VAV's - circuit / disconnect / connection | 155 ea | 298.83 /ea | 46,318 |
| Acid neutralization tanks / PH monitoring - circuit / connection | 2 ea | 965.80 /ea | 1,932 |
| Circuit breaker - 20A/1P (panel) | 1 ea | 149.86 /ea | 150 |
| Switchboard: 3000A bus, 2500A rated MCB (100%), 480/277V, 3PH, 65kAIC | 1 ea | 45,417.04 /ea | 45,417 |
| Panelboard: 100A, 42-circuit | 14 ea | 2,550.41 /ea | 35,706 |
| Panelboard: 225A, 42-circuit | 9 ea | 3,420.66 /ea | 30,786 |
| Panelboard: 225A, 84-circuit | 9 ea | 4,338.66 /ea | 39,048 |
| Panelboard: 400A, 42-circuit | 3 ea | 5,435.74 /ea | 16,307 |
| Panelboard: 400A, 84-circuit | 1 ea | 10,724.46 /ea | 10,724 |
| Distribution panel: 600A | 2 ea | 9,886.92 /ea | 19,774 |
| Distribution panel: 800A | 3 ea | 12,443.25 /ea | 37,330 |
| Transformer: floor/wall - 75kVA, 480V:208V | 1 ea | 4,384.00 /ea | 4,384 |
| K-13 Transformer: floor - 225kVA, 480V:208V | 3 ea | 12,168.50 /ea | 36,506 |
| Engineered Services - Training (Manufacturer) | 1 ea | 4,165.70 /ea | 4,166 |
| Engineered Services - Start-Up Assistance (Manufacturer) | 1 ea | 3,519.08 /ea | 3,519 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5010 Gear & Distribution** | | | |
| Feeder (EMT/CU) - 20A [BMS to utility meter] | 200 lf | 7.43 /lf | 1,486 |
| Feeder (EMT/CU) - 20A [EP1A to Elevator Controller] | 125 lf | 7.43 /lf | 929 |
| Feeder (EMT/CU) - 60A [MSB to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [2DP1A to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [2DP1B to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [2DP1C to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [4DP1B to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 90A [2DP1A to KPP1A] | 42 lf | 15.96 /lf | 670 |
| Feeder (EMT/CU) - 100A [MSB to LP1A] | 40 lf | 20.74 /lf | 830 |
| Feeder (EMT/CU) - 100A [4DP1B to LP1B] | 50 lf | 20.74 /lf | 1,037 |
| Feeder (EMT/CU) - 100A [4DP1C to LP1C] | 27 lf | 20.74 /lf | 560 |
| Feeder (EMT/CU) - 100A [4DP1B to LP2B] | 50 lf | 20.74 /lf | 1,037 |
| Feeder (EMT/CU) - 100A [2DP1A to LP2C] | 190 lf | 20.74 /lf | 3,940 |
| Feeder (EMT/CU) - 100A [4DP1B to LP3B] | 150 lf | 20.74 /lf | 3,111 |
| Feeder (EMT/CU) - 100A [4DP1C to LP3C] | 165 lf | 20.74 /lf | 3,422 |
| Feeder (EMT/CU) - 100A [MSB to LP1D] | 150 lf | 20.74 /lf | 3,111 |
| Feeder (EMT/CU) - 100A [EHP1A to Elevator Controller] | 125 lf | 20.74 /lf | 2,592 |
| Feeder (EMT/CU) - 100A [TEP1A to TEP2B] | 200 lf | 20.74 /lf | 4,148 |
| Feeder (EMT/CU) - 100A [TEP1A to TEP2C] | 200 lf | 20.74 /lf | 4,148 |
| Feeder (EMT/CU) - 100A [TEP1A to TEP1D] | 200 lf | 20.74 /lf | 4,148 |
| Feeder (EMT/CU) - 100A [TEP1A to UPS] | 50 lf | 20.74 /lf | 1,037 |
| Feeder (EMT/CU) - 100A [2DP1A to MP1A] | 410 lf | 20.74 /lf | 8,503 |
| Feeder (EMT/CU) - 125A [UPS to EP1A] | 150 lf | 20.99 /lf | 3,149 |
| Feeder (EMT/CU) - 150A [2DP1B to MP1B] | 50 lf | 26.82 /lf | 1,341 |
| Feeder (EMT/CU) - 150A [2DP1C to MSB] | 200 lf | 26.82 /lf | 5,365 |
| Feeder (EMT/CU) - 150A [2DP1C to MP3C] | 250 lf | 26.82 /lf | 6,706 |
| Feeder (EMT/CU) - 150A [2DP1B to PP2B] | 60 lf | 26.82 /lf | 1,609 |
| Feeder (EMT/CU) - 150A [2DP1C to PP2C] | 100 lf | 26.82 /lf | 2,682 |
| Feeder (EMT/CU) - 150A [2DP1B to PP1B] | 50 lf | 26.82 /lf | 1,341 |
| Feeder (EMT/CU) - 150A [2DP1C to MP1C] | 40 lf | 26.83 /lf | 1,073 |
| Feeder (EMT/CU) - 150A [2DP1C to PP2C] | 125 lf | 26.82 /lf | 3,353 |
| Feeder (EMT/CU) - 150A [2DP1C to PP3C] | 150 lf | 26.82 /lf | 4,024 |
| Feeder (EMT/CU) - 150A [4DP1C to PP3B] | 165 lf | 26.82 /lf | 4,426 |
| Feeder (EMT/CU) - 150A [2DP1C to PP1C] | 50 lf | 26.82 /lf | 1,341 |
| Feeder (EMT/CU) - 150A [2DP1A to PP1D] | 100 lf | 26.82 /lf | 2,682 |
| Feeder (EMT/CU) - 200A [MSB to ATS-LS] | 100 lf | 32.13 /lf | 3,213 |
| Feeder (EMT/CU) - 200A [ATS-LS to ELP1A] | 40 lf | 32.13 /lf | 1,285 |
| Feeder (EMT/CU) - 200A [2DP1A to PP1A] | 50 lf | 32.13 /lf | 1,607 |
| Feeder (EMT/CU) - 200A [Cam Lock Box to ATS-LS] | 60 lf | 32.13 /lf | 1,928 |
| Feeder (EMT/CU) - 225A [MSB to Dimming Rack HDP] | 250 lf | 46.72 /lf | 11,679 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5010 Gear & Distribution** | | | |
| Feeder (EMT/CU) - 225A [2DP1A to Dimming Rack SDP] | 200 lf | 46.72 /lf | 9,344 |
| Feeder (EMT/CU) - 225A [EHP1A to EHP3C] | 250 lf | 46.72 /lf | 11,679 |
| Feeder (EMT/CU) - 225A [MP3C to PP3C] | 45 lf | 46.72 /lf | 2,102 |
| Feeder (EMT/CU) - 225A [2DP1B to MP3B] | 100 lf | 46.72 /lf | 4,672 |
| Feeder (EMT/CU) - 225A [4DP1C to MHP3C] | 165 lf | 49.70 /lf | 8,200 |
| Feeder (EMT/CU) - 225A [ATS-OS to EHP1A] | 200 lf | 49.70 /lf | 9,940 |
| Feeder (EMT/CU) - 225A [MSB to ATS-OS] | 75 lf | 49.70 /lf | 3,727 |
| Feeder (EMT/CU) - 400A [MSB to MHP1A] | 50 lf | 73.75 /lf | 3,688 |
| Feeder (EMT/CU) - 400A [EHP1C to EHP1A] | 100 lf | 73.75 /lf | 7,375 |
| Feeder (EMT/CU) - 400A [Generator to ATS-LR] (interior) | 430 lf | 73.75 /lf | 31,713 |
| Feeder (EMT/CU) - 400A [MSB to ATS-LR] | 375 lf | 78.46 /lf | 29,422 |
| Feeder (EMT/CU) - 400A [MHP-LR to ATS-LR] | 10 lf | 78.46 /lf | 785 |
| Feeder (EMT/CU) - 400A [ATS-LR to MHP-LR] | 50 lf | 73.75 /lf | 3,688 |
| Feeder (EMT/CU) - 600A [MSB to 4DP1B] | 200 lf | 108.91 /lf | 21,782 |
| Feeder (EMT/CU) - 600A [MSB to 2DP1A] | 70 lf | 108.91 /lf | 7,624 |
| Feeder (EMT/CU) - 800A [MSB to 2DP1C] | 125 lf | 138.78 /lf | 17,348 |
| Feeder (EMT/CU) - 800A [MSB to 4DP1C] | 200 lf | 138.78 /lf | 27,757 |
| Empty conduit (EMT) - 3/4" [utility meter to switchboard] | 75 lf | 6.28 /lf | 471 |
| Feeder (MC) - 125A [75kVA] | 30 lf | 12.82 /lf | 385 |
| Feeder (MC) - 225A [75kVA] | 30 lf | 35.43 /lf | 1,063 |
| Feeder (MC) - 400A [225kVA] | 90 lf | 59.32 /lf | 5,339 |
| Feeder (MC) - 800A [225kVA] | 90 lf | 111.65 /lf | 10,048 |
| M.I. Cable - 4-1/c #6 [ELP1B to ELP3B] | 150 lf | 36.15 /lf | 5,422 |
| M.I. Cable - 4-1/c #3 [EHP1A to EP3C] | 165 lf | 65.42 /lf | 10,794 |
| M.I. Cable - 4-1/c #3 [ELP1A to EDP] | 125 lf | 65.42 /lf | 8,178 |
| M.I. Cable - 4-1/c #3 [ELP1A to EP1C] | 125 lf | 65.42 /lf | 8,178 |
| M.I. Cable - 4-1/c #2 [EPL1A to ELP1B] | 150 lf | 72.60 /lf | 10,890 |
| M.I. Cable - 4-1/c #2 [ELP1A to ELP1D] | 417 lf | 77.24 /lf | 32,208 |
| Quick term kit - #6 4-1/c | 2 ea | 359.96 /ea | 720 |
| Quick term kit - #3 4-1/c | 6 ea | 710.21 /ea | 4,261 |
| Quick term kit - #2 4-1/c | 4 ea | 734.64 /ea | 2,939 |
| Brass plate (per hole) | 12 ea | 92.10 /ea | 1,105 |
| Empty conduit - sch 40 PVC: 1 x 2" [future Canopy PV] | 280 lf | 26.88 /lf | 7,526 |
| Empty conduit - sch 40 PVC: 2 x 2" [future PV] | 1,250 lf | 35.04 /lf | 43,800 |
| Empty conduit - sch 40 PVC: 2 x 4" [future Canopy PV] | 160 lf | 45.14 /lf | 7,222 |
| ATS-OS: 225A, 277/480V, 4P, no iso by-pass - open transition | 1 ea | 6,752.90 /ea | 6,753 |
| ATS-LS: 150A, 277/480V, 4P, w/ iso by-pass - open transition | 1 ea | 11,058.30 /ea | 11,058 |
| ATS-LR: 400A, 277/480V, 4P, w/ iso by-pass - open transition | 1 ea | 19,961.43 /ea | 19,961 |
| Power junction w/feed (EMT) - 20A | 1 ea | 337.91 /ea | 338 |
| Empty conduit (EMT) - 3/4" | 2,000 lf | 5.11 /lf | 10,218 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| *D5010 Gear & Distribution* | **136,600** *sf* | *8.18 /sf* | *1,117,861* |
| **D5020 Lighting & Branch Wiring** | | | |
| Lull, laborer for cleanup by Consigli (Electrical) | (1) ls | 230,000.00 /ls | (230,000) |
| Trade support - lull, laborer for cleanup (Electrical) | 1 ls | 230,000.00 /ls | 230,000 |
| Science Classrooms - CO system solenoid shutdown- 120V power & control wiring | 2 ea | 5,326.40 /ea | 10,653 |
| Kitchen - Ansul system - 120V power & control wiring | 1 ea | 10,237.00 /ea | 10,237 |
| Gym scoreboards and shot clocks - wiring only, F&I by Div. 11 | 2 ea | 5,344.80 /ea | 10,690 |
| On-site programming & startup (manufacturer) | 1 ls | 3,913.41 /ls | 3,913 |
| Single pole switch (120/277V) | 13 ea | 65.04 /ea | 845 |
| Key op switch (120/277V) | 2 ea | 72.44 /ea | 145 |
| Three position momentary contact switch | 1 ea | 226.42 /ea | 226 |
| Ceiling PIR occupancy sensor (24VDC) | 323 ea | 247.23 /ea | 79,854 |
| Occupancy sensor power packs (120V) | 200 ea | 82.04 /ea | 16,408 |
| Wall dimmer switch (0-10V) | 227 ea | 131.04 /ea | 29,746 |
| Photocells (daylight harvesting) | 84 ea | 265.06 /ea | 22,265 |
| Universal dimming room controller, 1-channel | 50 ea | 536.88 /ea | 26,844 |
| ALCS master switching / dimming station | 1 ea | 821.83 /ea | 822 |
| Plug load controllers (20A/120V) | 50 ea | 300.80 /ea | 15,040 |
| Emergency lighting transfer (bypass relay) - non-dimming | 30 ea | 236.81 /ea | 7,104 |
| Astronomical time clock | 1 ea | 919.97 /ea | 920 |
| Rough in for Theater Lighting - Allowance | 1 allw | 9,400.01 /allw | 9,400 |
| Power for Theater Lighting - Allowance | 1 allw | 28,199.87 /allw | 28,200 |
| Sub lighting control panels | 3 ea | 2,394.56 /ea | 7,184 |
| Master lighting control panel | 1 ea | 4,383.41 /ea | 4,383 |
| Energy control unit | 1 ea | 2,157.58 /ea | 2,158 |
| System server unit | 1 ea | 1,316.75 /ea | 1,317 |
| Network Ethernet switch | 1 ea | 2,270.85 /ea | 2,271 |
| MC Cable (12/2) - 20A | 12,500 lf | 3.45 /lf | 43,126 |
| MC Cable (12/3) - 20A | 3,500 lf | 3.87 /lf | 13,541 |
| EMT (12/2) - 20A | 2,000 lf | 6.70 /lf | 13,404 |
| EMT (12/2) - 20A | 50 lf | 7.13 /lf | 356 |
| RJ45 Cable, 25LF (plenum-rated) | 407 ea | 72.10 /ea | 29,344 |
| RJ45 Cable, 50LF (plenum rated) | 228 ea | 111.05 /ea | 25,318 |
| MC Cable (12/2) - 20A | 11,370 lf | 3.45 /lf | 39,227 |
| MC Cable (10/2) - 20A [homeruns - x372] | 24,180 lf | 4.36 /lf | 105,516 |
| EMT (12/2) - 20A | 2,000 lf | 6.70 /lf | 13,404 |
| PVC (10/2) - 20A | 450 lf | 6.68 /lf | 3,007 |
| Duplex receptacle - 20A - tamper resistant | 497 ea | 78.60 /ea | 39,065 |
| Duplex receptacle - 20A - switched with IO module | 14 ea | 67.78 /ea | 949 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5020 Lighting & Branch Wiring** | | | |
| Simplex receptacle - 20A [scoreboard control] | 2 ea | 70.18 /ea | 140 |
| Duplex receptacle - 20A - GFCI | 187 ea | 92.44 /ea | 17,286 |
| Duplex receptacle - 20A - GFCI - W.P. | 29 ea | 129.27 /ea | 3,749 |
| Duplex receptacle - 20A [kitchen equipment] - circuitry in Equipment Wiring] | 33 ea | 67.79 /ea | 2,237 |
| Duplex receptacle - 20A [A/V] | 9 ea | 67.79 /ea | 610 |
| Duplex receptacle - 20A [CR] | 8 ea | 67.80 /ea | 542 |
| Exterior pedestal receptacle, GFI type, Wayne Tyler, Inc. #CB-BOX | 5 ea | 1,292.26 /ea | 6,461 |
| Quadruplex receptacle - 20A | 325 ea | 93.78 /ea | 30,479 |
| Quadruplex receptacle - 20A - switched with IO module | 18 ea | 93.79 /ea | 1,688 |
| Duplex receptacle - 20A - USB | 14 ea | 99.44 /ea | 1,392 |
| Specialty receptacle - 20A - L5-20R | 11 ea | 101.01 /ea | 1,111 |
| Specialty receptacle - 20A - L14-20R | 1 ea | 104.81 /ea | 105 |
| Specialty receptacle - 30A - L5-30R | 23 ea | 111.69 /ea | 2,569 |
| Quadruplex receptacle - 20A - GFCI | 5 ea | 143.12 /ea | 716 |
| Hardwired A/C junction (MC) - 20A [A/V] | 2 ea | 318.93 /ea | 638 |
| Hardwired A/C junction (MC) - 20A [fume hoods] | 4 ea | 318.93 /ea | 1,276 |
| Power junction w/feed (MC) - 20A [water coolers/bottle fillers] | 11 ea | 221.21 /ea | 2,433 |
| Power junction w/feed (MC) - 20A | 28 ea | 221.21 /ea | 6,194 |
| Trash compactor feed & connection | 2 ea | 2,243.92 /ea | 4,488 |
| Overhead door power & connection | 3 ea | 1,223.50 /ea | 3,671 |
| Dock leveler feed & connection | 1 ea | 3,532.90 /ea | 3,533 |
| Emergency power offs (EPO) | 10 ea | 295.11 /ea | 2,951 |
| Wiremold receptacles - G4 | 110 ea | 31.05 /ea | 3,416 |
| G4000 dual-channel wiremold - 24" spacing | 220 lf | 63.39 /lf | 13,945 |
| LK24: 2'x2' lay-in fixture [O] | 24 ea | 198.57 /ea | 4,766 |
| SPFL: LED flood light [C] | 20 ea | 682.90 /ea | 13,658 |
| SPNF: LED flood light, narrow [C] | 20 ea | 682.90 /ea | 13,658 |
| LR2 (emerg): 2' linear 2" aperature recessed luminaire [O] | 183 ea | 300.48 /ea | 54,987 |
| LR2: 2' linear 2" aperature recessed luminaire [O] | 912 ea | 300.48 /ea | 274,033 |
| G4: 4' linear rugged low profile 360 deg adjustable flood luminaire [O] | 80 ea | 2,155.93 /ea | 172,474 |
| LS4: 4' utility fixtre with frosted acrylic diffuser [O] | 20 ea | 246.16 /ea | 4,923 |
| LS4 (emerg): 4' utility fixture with frosted acrylic diffuser [O] | 14 ea | 246.16 /ea | 3,446 |
| LS8: 8' utility fixtre with frosted acrylic diffuser [O] | 11 ea | 411.94 /ea | 4,531 |
| LS4A (emerg): 4' utility fixtre with frosted acrylic diffuser [O] | 12 ea | 494.94 /ea | 5,939 |
| LS4A: 4' utility fixture with frosted acrylic diffuser [O] | 12 ea | 494.94 /ea | 5,939 |
| LP8 (emerg): Axis 8' LED fixture [O] | 9 ea | 1,027.94 /ea | 9,251 |
| LS8 (emerg): 8' utility fixture with frosted acrylic diffuser [O] | 10 ea | 411.94 /ea | 4,119 |
| JB: utility fixture with frosted tempered glass globe & guard [O] | 4 ea | 245.95 /ea | 984 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5020 Lighting & Branch Wiring** | | | |
| PC3: 6" down light fixture with dead-front gasketed trim [O] | 1 ea | 298.16 /ea | 298 |
| LRW (emerg): 6" aperature LED linear recessed fixture / qty. of 18 [C] | 114 lf | 146.99 /lf | 16,757 |
| PC1: 4" down light fixture, 0-10V dimming capable [O] | 24 ea | 298.16 /ea | 7,156 |
| RC1: 6" down light fixture [O] | 45 ea | 271.54 /ea | 12,219 |
| RC1 (emerg): 6" down light fixture [O] | 18 ea | 271.54 /ea | 4,888 |
| LS2 (emerg): 2' utility fixture [O] | 2 ea | 177.98 /ea | 356 |
| LSV4: 4' linear utility fixture with prismatic polcarbonate lens [C] | 4 ea | 675.93 /ea | 2,704 |
| RC2: 4" down light fixture, 0-10V dimming [O] | 8 ea | 230.56 /ea | 1,844 |
| LR4: 4' linear 2" aperature recessed luminaire with frosted lens [O] | 1 ea | 410.45 /ea | 410 |
| LUL: LED tape light with AL channel [C] | 1,840 lf | 88.49 /lf | 162,829 |
| LC3: linear cove Xeleum lighting / qty. of 96 [O] | 1,925 lf | 121.99 /lf | 234,826 |
| LWW: LED tape light with AL channel [C] | 1,408 lf | 88.49 /lf | 124,599 |
| RSH: 6" down light fixture with dead-front gasketed trim [O] | 1 ea | 306.54 /ea | 307 |
| LC2: linear cove fixture with frosted diffuser / qty. of 10 [O] | 76 lf | 148.23 /lf | 11,265 |
| PC2: 6" down light fixture with dead-front gasketed trim [O] | 28 ea | 298.16 /ea | 8,348 |
| LCL: LED tape light with AL channel [C] | 3,051 lf | 88.49 /lf | 269,994 |
| LSL: LED strip mounted on edge of stage / qty. of 1 | 59 lf | 305.95 /lf | 18,051 |
| Exit sign, ceiling mounted, double sided [O] | 34 ea | 196.16 /ea | 6,669 |
| Exit sign, ceiling mounted, single sided [O] | 16 ea | 183.16 /ea | 2,931 |
| Exit sign, wall mounted | 18 ea | 313.16 /ea | 5,637 |
| Exit sign, ceiling mounted, single sided - handicap [O] | 2 ea | 433.16 /ea | 866 |
| LRC (emerg): 6" aperature LED linear recessed fixture / qty. of 46 [C] | 596 lf | 161.70 /lf | 96,373 |
| MC Cable (12/2) - 20A (concealed branch) | 12,068 lf | 3.67 /lf | 44,291 |
| MC Cable (10/2) - 20A (concealed homeruns) | 2,400 lf | 4.64 /lf | 11,142 |
| EMT (12/2) - 20A (exposed branch) | 4,023 lf | 7.13 /lf | 28,679 |
| EMT (10/2) - 20A (exposed homeruns) | 500 lf | 8.58 /lf | 4,290 |
| SL4: LED egress / perimeter lighting fixture - custom color/finish [O] | 40 ea | 565.36 /ea | 22,614 |
| MC Cable (12/2) - 20A | 1,200 lf | 3.67 /lf | 4,404 |
| *D5020 Lighting & Branch Wiring* | ***136,600 sf*** | *17.61 /sf* | *2,405,966* |
| **D5030 Communications & Security** | | | |
| Externally mounted SPD's | 6 ea | 3,131.70 /ea | 18,790 |
| Tel/data J-hook system (plenum) | 136,600 sf | 0.19 /sf | 25,681 |
| Cable tray - 18"W (IDF/MDF only) | 200 lf | 75.55 /lf | 15,109 |
| Empty conduit (EMT) - 2" | 650 lf | 11.19 /lf | 7,271 |
| Copper ground bar w/isolators - 2"x1/4" | 4 ea | 280.03 /ea | 1,120 |
| Conduit sleeve w/ fireproofing - 4" | 20 ea | 201.11 /ea | 4,022 |
| Data outlet - (1) CAT-6A cable | 20 ea | 264.84 /ea | 5,297 |
| Data outlet - (1) CAT-6A cable [audio-visual] | 12 ea | 264.84 /ea | 3,178 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5030 Communications & Security** | | | |
| Data outlet - (2) CAT-6A cables | 131 ea | 466.16 /ea | 61,067 |
| Tel/data outlet - (3) CAT-6A cables | 91 ea | 652.82 /ea | 59,407 |
| Floor box tel/data outlet - (3) CAT-6A cables | 2 ea | 652.83 /ea | 1,306 |
| Voice outlet - (1) CAT-6A cable (WAP's by Owner) | 79 ea | 263.70 /ea | 20,832 |
| Wireless access point - (1) CAT-6A cable (WAP's by Owner) | 138 ea | 263.70 /ea | 36,390 |
| TVE - Video outlet | 56 ea | 838.75 /ea | 46,970 |
| TVC - Video outlet | 2 ea | 838.77 /ea | 1,678 |
| Double gang junction box with (4) 1" C | 54 ea | 482.68 /ea | 26,065 |
| FO - 12 strand SM | 1,750 lf | 5.27 /lf | 9,225 |
| FO - 12 strand MM | 1,500 lf | 7.10 /lf | 10,642 |
| 4-Post Full Height Rack | 10 ea | 1,170.17 /ea | 11,702 |
| Vertical cable wire manager | 20 ea | 314.09 /ea | 6,282 |
| Horizontal cable wire manager | 10 ea | 80.25 /ea | 803 |
| Copper patch panel - 96 port | 15 ea | 1,244.28 /ea | 18,664 |
| Fiber optic patch panel - 24 port | 6 ea | 570.06 /ea | 3,420 |
| Fiber enclosure (rack mtd.) | 6 ea | 485.85 /ea | 2,915 |
| Network switch - 24 port | 2 ea | 5,390.24 /ea | 10,780 |
| S1: wall mounted loudspeaker - 1 gang metal box w/ cover | 2 ea | 228.33 /ea | 457 |
| S2: ceiling loud speaker - custom backbox | 6 ea | 308.23 /ea | 1,849 |
| S3: ceiling loud speaker - 4" SQ metal box w/ cover | 16 ea | 179.94 /ea | 2,879 |
| S4: ceiling loud speaker - 4" SQ metal box w/ cover | 2 ea | 251.94 /ea | 504 |
| S5: ceiling loud speaker - 4" SQ metal box w/ cover (New) | 2 ea | 245.27 /ea | 491 |
| D1: display back box, Chief PAC-526 | 3 ea | 371.35 /ea | 1,114 |
| F1: floor box, FSR FL-500P-6 floor box w/ finished cover | 1 ea | 469.58 /ea | 470 |
| V1: wall mounted video projector - 1 gang metal box w/ cover | 1 ea | 179.47 /ea | 179 |
| R1: receptacle panel - 2 gang metal box w/ cover | 3 ea | 242.43 /ea | 727 |
| R2: receptacle panel - 12"x12"x4" NEMA-1 enclosure w/ oversized flush | 2 ea | 242.43 /ea | 485 |
| R3: receptacle panel - 3 gang metal box w/ cover | 4 ea | 311.69 /ea | 1,247 |
| R5: receptacle panel - 3 gang metal box w/ cover | 1 ea | 242.43 /ea | 242 |
| R6: receptacle panel - 12"x12"x4" NEMA-1 enclosure w/ oversized flush | 2 ea | 405.94 /ea | 812 |
| BP: wall mounted button panel - 1 gang metal box w/ cover | 3 ea | 221.77 /ea | 665 |
| J1: junction box - type 1 - 12"x12"x4" NEMA-1 enclosure w/ oversized flush | 2 ea | 723.57 /ea | 1,447 |
| J2: junction box - type 2 - 18"x18"x4" NEMA-1 enclosure w/ oversized flush | 1 ea | 844.78 /ea | 845 |
| J3: junction box - type 3 - same as Type 2 | 3 ea | 844.78 /ea | 2,534 |
| A1: Wall mounted antenna - 1 gang deep metal box w/ cover | 2 ea | 159.74 /ea | 319 |
| A2: Wall mounted antenna - 1 gang deep metal box w/ cover | 1 ea | 159.74 /ea | 160 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5030 Communications & Security** | | | |
| A3: Ceiling mounted antenna - 4" SQ metal box w/ cover | 2 ea | 138.32 /ea | 277 |
| A4: Ceiling mounted antenna - 4" SQ metal box w/ cover | 1 ea | 138.31 /ea | 138 |
| PS: Production communication speaker station - 4 gang deep metal box w/ cov | 5 ea | 385.28 /ea | 1,926 |
| PC: Production communication - 1 gang deep metal box w/ cover | 1 ea | 134.38 /ea | 134 |
| T1: Wall mounted touch panel - 3 gang metal box w/ cover | 2 ea | 249.04 /ea | 498 |
| VC: Wall mounted audio volume control - 1 gang deep metal box | 2 ea | 134.39 /ea | 269 |
| MC: Motor controller - 4" SQ metal box w/ cover | 3 ea | 86.46 /ea | 259 |
| C1: Wall mounted camera - 2 gang deep metal box w/ cover | 1 ea | 193.57 /ea | 194 |
| A/V Equipment Rack | 2 ea | 1,001.85 /ea | 2,004 |
| M1: Ceiling mounted microphone - 1 gang deep metal box w/ cover | 1 ea | 134.38 /ea | 134 |
| Intercom sub-stations | 6 ea | 1,009.28 /ea | 6,056 |
| Intercom master-stations | 5 ea | 3,327.13 /ea | 16,636 |
| Speaker - ceiling mouted | 269 ea | 405.93 /ea | 109,194 |
| Speaker - wall mounted | 32 ea | 611.85 /ea | 19,579 |
| Volume control | 24 ea | 177.96 /ea | 4,271 |
| Power supply (80) units - speakers 24V DC | 4 ea | 2,661.71 /ea | 10,647 |
| PA console | 1 ea | 14,251.90 /ea | 14,252 |
| PA equipment power connection - 120V | 1 ea | 256.53 /ea | 257 |
| AM/FM/CD/DVD tuner | 1 ea | 694.40 /ea | 694 |
| Speaker system testing | 1 ea | 1,986.71 /ea | 1,987 |
| Two way communication call box (recessed) | 20 ea | 799.75 /ea | 15,995 |
| Power supply w/battery back up | 1 ea | 1,714.28 /ea | 1,714 |
| Two way communication base station (28 zone) | 1 ea | 5,980.66 /ea | 5,981 |
| Tel/data outlet - (1) CAT-6A cable | 20 ea | 264.84 /ea | 5,297 |
| Tel/data outlet - (2) CAT-6A cables | 1 ea | 466.16 /ea | 466 |
| System testing | 1 ea | 1,016.70 /ea | 1,017 |
| Clock, wall mounted - 12" round | 126 ea | 283.06 /ea | 35,665 |
| Master clock w/ roof mounted antenna | 1 ea | 3,778.57 /ea | 3,779 |
| Wireless clock repeater | 1 ea | 647.06 /ea | 647 |
| Wireless clock transciever | 1 ea | 647.06 /ea | 647 |
| Program unit | 1 ea | 991.96 /ea | 992 |
| Speaker baffle, clock back box | 74 ea | 202.78 /ea | 15,006 |
| Wire guard | 20 ea | 57.70 /ea | 1,154 |
| Clock wiring (EMT) | 700 lf | 7.03 /lf | 4,923 |
| Clock wiring (RS-485 plenum) | 500 lf | 3.08 /lf | 1,540 |
| System testing | 1 ls | 33.83 /ls | 34 |
| Card readers | 22 ea | 1,163.83 /ea | 25,604 |
| Card readers - W.P. | 3 ea | 1,967.78 /ea | 5,903 |
| Electro-magnetic lock | 6 ea | 657.91 /ea | 3,947 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5030 Communications & Security** | | | |
| Request to exit motion sensor | 26 ea | 322.33 /ea | 8,380 |
| Electric strike | 40 ea | 400.49 /ea | 16,020 |
| Thermal disconnecting means | 20 ea | 427.58 /ea | 8,552 |
| 24V power supply | 20 ea | 295.11 /ea | 5,902 |
| Junction box - 6"x6"x4" | 20 ea | 130.61 /ea | 2,612 |
| Power transfer hinge | 20 ea | 377.68 /ea | 7,554 |
| Intrusion digital keypads | 4 ea | 984.97 /ea | 3,940 |
| Dual tech motion detectors | 77 ea | 595.80 /ea | 45,876 |
| Door contacts | 63 ea | 465.74 /ea | 29,342 |
| Access control panel | 1 ea | 8,222.56 /ea | 8,223 |
| Tie in to lighting control system | 1 ea | 402.23 /ea | 402 |
| Security wiring - cable | 7,500 lf | 3.80 /lf | 28,527 |
| Security wiring (EMT) | 2,250 lf | 8.53 /lf | 19,181 |
| Power junctions - 120V/20A | 2 ea | 193.20 /ea | 386 |
| Connect to CCTV system | 1 ea | 665.43 /ea | 665 |
| Proximity cards | 250 ea | 2.35 /ea | 588 |
| Software / licenses, programming, testing, startup (manufacturer) | 1 ea | 13,308.52 /ea | 13,309 |
| CCTV color monitors | 2 ea | 815.52 /ea | 1,631 |
| 360-degree multi-sensor interior cameras | 28 ea | 1,659.85 /ea | 46,476 |
| Dome I.P. camera - exterior | 19 ea | 1,996.28 /ea | 37,929 |
| Dome I.P. camera - interior - fixed | 27 ea | 1,471.85 /ea | 39,740 |
| Camera monitoring station | 1 ea | 1,330.85 /ea | 1,331 |
| Video recorders | 2 ea | 3,131.71 /ea | 6,263 |
| Video switchers | 2 ea | 1,627.71 /ea | 3,255 |
| Camera wiring (EMT) | 2,500 lf | 8.76 /lf | 21,899 |
| Camera wiring - cable | 7,400 lf | 4.04 /lf | 29,885 |
| Power junction - 120V/20A | 2 ea | 193.20 /ea | 386 |
| Software / licenses, programming, testing, startup (manufacturer) | 1 ea | 13,308.52 /ea | 13,309 |
| *Temporary fire alarm heat detection coverage / stairwell pull stations / temp notification - N/A* | - | /- | |
| Fire alarm impairment plan (NFPA-101) | 1 ls | 10,000.00 /ls | 10,000 |
| Elevator fire alarm interfacing | 1 ls | 5,000.00 /ls | 5,000 |
| Manual pull stations | 25 ea | 202.12 /ea | 5,053 |
| Smoke detectors | 82 ea | 220.39 /ea | 18,072 |
| Smoke detector w/ elevator recall | 3 ea | 373.26 /ea | 1,120 |
| Smoke detectors (for Atrium) | 89 ea | 220.39 /ea | 19,615 |
| Smoke detectors w/ elevator recall (for Atrium) | 3 ea | 373.25 /ea | 1,120 |
| Carbon monoxide detector (w/ monitor module) | 5 ea | 367.16 /ea | 1,836 |
| Beam detector (receiver & transmitter) | 5 ea | 416.88 /ea | 2,084 |
| Duct smoke detector (furnish & wire) | 40 ea | 838.91 /ea | 33,556 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5030 Communications & Security** | | | |
| Remote test switch w/ indicating light | 40 ea | 194.88 /ea | 7,795 |
| Control modules | 20 ea | 265.75 /ea | 5,315 |
| Addressable monitor modules | 30 ea | 160.83 /ea | 4,825 |
| Tamper switch connection (via monitor module) | 8 ea | 560.06 /ea | 4,480 |
| Flow switch connection (via monitor module) | 8 ea | 403.67 /ea | 3,229 |
| Door hold device (magnetic) | 5 ea | 388.88 /ea | 1,944 |
| Wire motorized dampers (120V) | 14 ea | 407.48 /ea | 5,705 |
| Wire combination fire/smoke damper (120V & SLC) | 20 ea | 608.50 /ea | 12,170 |
| Strobe only | 48 ea | 175.36 /ea | 8,417 |
| Speaker/strobes | 150 ea | 246.56 /ea | 36,983 |
| Speaker/strobe - W.P. | 1 ea | 309.72 /ea | 310 |
| Horn/visual - wall mounted | 52 ea | 222.79 /ea | 11,585 |
| Exterior beacons (weatherproof) | 4 ea | 388.83 /ea | 1,555 |
| Fire alarm transponder panels | 6 ea | 928.51 /ea | 5,571 |
| Fire alarm annunciators w/ microphones | 3 ea | 2,107.39 /ea | 6,322 |
| FACP w/ 60-minute battery backup (Notifier NFS640) | 1 ea | 6,999.66 /ea | 7,000 |
| Masterbox (local energy) | 1 ea | 4,212.70 /ea | 4,213 |
| Key (Knox) box | 2 ea | 806.43 /ea | 1,613 |
| Smoke control panel | 1 ea | 19,502.56 /ea | 19,503 |
| Generator monitoring control panel | 1 ea | 571.80 /ea | 572 |
| Fire pump/jockey pump connection | 1 ea | 402.23 /ea | 402 |
| Fire alarm graphic maps | 3 ea | 1,454.56 /ea | 4,364 |
| Fire alarm comissioning | 1 ea | 6,158.00 /ea | 6,158 |
| Fire alarm testing (manufacturer) | 6 ea | 1,338.28 /ea | 8,030 |
| Fire alarm system programming | 397 ea | 20.79 /ea | 8,254 |
| FPLP cable (red) - #14-4/c | 11,475 lf | 2.23 /lf | 25,589 |
| FPLP cable (red) - #16-2/c | 12,330 lf | 1.83 /lf | 22,564 |
| EMT (red) - 3/4"C w/ #16-2/c (exposed) | 2,500 lf | 7.19 /lf | 17,981 |
| EMT (red) - 3/4"C w/ #14-4/c (exposed) | 1,200 lf | 7.95 /lf | 9,535 |
| Circuit integrity cabling (CIC) | 1,500 lf | 18.31 /lf | 27,465 |
| BDA system - parts & smarts (dual-frequency) | 136,600 sf | 0.47 /sf | 64,202 |
| BDA system - installation & minor material (dual-frequency) | 136,600 sf | 0.19 /sf | 25,681 |
| Directional couplers | 20 ea | 1,150.35 /ea | 23,007 |
| In-Line connectors | 20 ea | 249.01 /ea | 4,980 |
| Lightning protection units | 5 ea | 1,995.53 /ea | 9,978 |
| *D5030 Communications & Security* | ***136,600** sf* | *12.09 /sf* | *1,652,074* |
| **D5090 Other Electrical Systems** | | | |
| LEED Silver - premium (T.B.D.) | 1 ls | 9,400.00 /ls | 9,400 |
| Temp light stringers & GFCI power | 136,600 sf | 0.35 /sf | 47,810 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **D5090 Other Electrical Systems** | | | |
| Temp 480Y/277V electrical service (400A) | 3 ea | 18,226.22 /ea | 54,679 |
| Material handling / project mgmt. | 250 mh | 97.71 /mh | 24,428 |
| 3D/BIM coordination | 500 mh | 97.71 /mh | 48,856 |
| Record drawings / as-builts | 1 ea | 5,318.52 /ea | 5,319 |
| Seismic & testing (panels, generator, lighting control, fire alarm) | 1 ls | 18,800.00 /ls | 18,800 |
| Coring - patching - firestopping | 136,600 sf | 0.09 /sf | 12,840 |
| Project phasing (re-mobilization) | 1 ls | 9,400.00 /ls | 9,400 |
| Hoisting & rigging (generator & switchboard) | 2 ls | 7,050.00 /ls | 14,100 |
| Building grounding & bonding | 136,600 sf | 0.11 /sf | 15,408 |
| SPD grounding (internal and external) | 47 ea | 120.29 /ea | 5,653 |
| Dry-type transformer grounding | 4 ea | 213.22 /ea | 853 |
| Copper ground bar - 2"x1/4" (ea.) | 5 ea | 280.03 /ea | 1,400 |
| Natural gas generator: 350kW / 437.5kVA | 1 ea | 133,322.25 /ea | 133,322 |
| Generator testing & start-up | 1 ea | 1,863.20 /ea | 1,863 |
| Generator annunciator panel | 1 ea | 1,447.40 /ea | 1,447 |
| Battery charger circuit (4#10 & 1#10G in 1"C) | 140 lf | 20.94 /lf | 2,932 |
| Jacket heater circuit | 140 lf | 34.49 /lf | 4,828 |
| Oil heater circuit | 140 lf | 53.66 /lf | 7,512 |
| Exterior W.P. sound attenuating enclosure (350kW) | 1 ea | 19,478.75 /ea | 19,479 |
| Remote status panel circuit | 140 lf | 9.64 /lf | 1,349 |
| Starting circuits - 2#14 MI cable | 140 lf | 12.76 /lf | 1,787 |
| Remote annunciator panel - 16#14 (EMT) | 100 lf | 15.81 /lf | 1,581 |
| Quick connect switch, ESL Storm Switch 3020 | 1 ea | 3,668.10 /ea | 3,668 |
| UPS: 480-208/120V, 24kW (static ts,manual by-pass, 8min batt.BU) | 2 ea | 30,061.40 /ea | 60,123 |
| Lightning prevention system subcontractor | 1 ls | 30,000.00 /ls | 30,000 |
| *D5090 Other Electrical Systems* | **136,600** *sf* | *3.95 /sf* | *538,839* |
| **D50 Electrical Systems** | **136,600 sf** | **41.84 /sf** | **5,714,740** |
| **D Services** | **136,600 sf** | **122.48 /sf** | **16,731,287** |

## E Equipment & Furnishings

### E10 Equipment

#### E1020 Institutional Equipment

| | | | |
|---|---|---|---|
| Loading dock equipment | 1 ls | 1,000.00 /ls | 1,000 |
| Misc. appliances | 1 ls | 10,000.00 /ls | 10,000 |
| Food service equipment - Allowance | 1 ls | 415,270.00 /ls | 415,270 |
| Vocational shop equipment | 1 ls | 25,000.00 /ls | 25,000 |
| *- Welding booths - In Above* | - | /- | |
| *- Portable welding fumes extractor - In Above* | - | /- | |
| *- Paint spray hoods - In Above* | - | /- | |
| *- Portable wood working equipment dust collector - In HVAC* | - | /- | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **E1020 Institutional Equipment** | | | |
| Kiln | 1 ls | 12,000.00 /ls | 12,000 |
| Sound systems @ Auditorium - Allowance | 1 allw | 200,000.00 /allw | 200,000 |
| Sound systems @ Gym - Allowance | 1 allw | 120,000.00 /allw | 120,000 |
| Sound systems @ Cafeteria - Allowance | 1 allw | 50,000.00 /allw | 50,000 |
| Sound systems @ Band/Chorus - Allowance | 2 allw | 30,000.00 /allw | 60,000 |
| Sound systems @ Drama - Allowance | 1 allw | 20,000.00 /allw | 20,000 |
| Projection screen @ Gym, Cafeteria | 2 ea | 10,000.00 /ea | 20,000 |
| Projection screen | 1 ea | 5,000.00 /ea | 5,000 |
| *Orchestra enclosures - FFE* | - | /- | |
| Theatrical rigging - Allowance | 1 ls | 158,300.00 /ls | 158,300 |
| Theatrical draperies - Allowance | 1 ls | 33,854.00 /ls | 33,854 |
| Theatrical lighting instruments & accessories - Allowance | 1 ls | 129,018.00 /ls | 129,018 |
| Theatrical lighting controls - Allowance | 1 ls | 95,749.00 /ls | 95,749 |
| Basketball backstop - ceiling-hung | 6 ea | 6,500.00 /ea | 39,000 |
| Gym divider curtain - electric roll up | 1,530 sf | 20.00 /sf | 30,600 |
| Athletic wall padding | 835 sf | 12.50 /sf | 10,438 |
| Vollyball system | 1 ls | 5,000.00 /ls | 5,000 |
| Fixed audience seating | 406 ea | 285.00 /ea | 115,710 |
| Retractable Bleachers at Gym | 650 seat | 155.00 /seat | 100,750 |
| *E1020 Institutional Equipment* | ***136,600 sf*** | *12.13 /sf* | *1,656,689* |
| **E1090 Other Equipment** | | | |
| Refrigerator | 7 ea | 1,200.00 /ea | 8,400 |
| *Ice maker - None shown* | - | /- | |
| *Undercounter refrigerator - None shown* | - | /- | |
| Microwave oven | 1 ea | 450.00 /ea | 450 |
| Range hood | 1 ea | 650.00 /ea | 650 |
| Range | 1 ea | 900.00 /ea | 900 |
| Dishwasher | 4 ea | 925.00 /ea | 3,700 |
| Washer/dryer - stackable | 2 ea | 1,500.00 /ea | 3,000 |
| Scoreboards - basketball | 1 ea | 7,500.00 /ea | 7,500 |
| *E1090 Other Equipment* | ***136,600 sf*** | *0.18 /sf* | *24,600* |
| **E10 Equipment** | **136,600 sf** | **12.31 /sf** | **1,681,288** |
| **E20 Furnishings** | | | |
| **E2010 Fixed Furnishings** | | | |
| Hardwood trim @ locker guardrail per A650 | 3,300 lf | 15.00 /lf | 49,500 |
| P-lam top panels @ locker guardrail per A650 | 1,025 lf | 50.00 /lf | 51,250 |
| P-lam side panels @ locker guardrail per A650 | 450 lf | 50.00 /lf | 22,500 |
| Casework for lockers (bank of 5) - including base | 1,025 lf | 250.00 /lf | 256,250 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **E2010 Fixed Furnishings** | | | |
| P-lam base cabinet w/top | 40 lf | 450.00 /lf | 18,000 |
| P-lam workstation w/top | 770 lf | 250.00 /lf | 192,500 |
| Mobile storage | 172 ea | 550.00 /ea | 94,600 |
| P-lam valance for fin tube | 570 lf | 45.00 /lf | 25,650 |
| P-lam 3/4" lip at counter for fin tube | 570 lf | 4.00 /lf | 2,280 |
| P-lam wall cabinet | 40 lf | 325.00 /lf | 13,000 |
| P-lam full height cabinet | 50 lf | 700.00 /lf | 35,000 |
| Bathroom vanity w/top | 210 lf | 250.00 /lf | 52,500 |
| Reception cabinet | 20 lf | 1,000.00 /lf | 20,000 |
| P-lam circulation desk | 10 lf | 750.00 /lf | 7,500 |
| P-lam work counter @ Admin | 10 lf | 1,500.00 /lf | 15,000 |
| P-lam counter @ Servery | 32 lf | 200.00 /lf | 6,400 |
| P-lam end/filler panels @ Admin | 10 lf | 135.00 /lf | 1,350 |
| Mailboxes | 18 lf | 415.00 /lf | 7,470 |
| Storage shelving | 380 lf | 150.00 /lf | 57,000 |
| Storage shelving w/MDF | 470 lf | 200.00 /lf | 94,000 |
| P-lam bookcases | 40 lf | 500.00 /lf | 20,000 |
| Built-in benches | 205 lf | 600.00 /lf | 123,000 |
| Display cases | 5 ea | 4,500.00 /ea | 22,500 |
| Misc. casework - Allowance | 136,600 sf | 1.00 /sf | 136,600 |
| Misc. lab equipment - Allowance | 1 ls | 25,000.00 /ls | 25,000 |
| Fume hoods | 3 ea | 11,000.00 /ea | 33,000 |
| Roller shades | 11,205 sf | 10.00 /sf | 112,050 |
| Roller shades - interior | 3,300 sf | 10.00 /sf | 33,000 |
| Roller shades - doors | 50 ea | 150.00 /ea | 7,500 |
| Base cabinet w/epoxy top | 30 lf | 600.00 /lf | 18,000 |
| Epoxy countertop - open below | 325 lf | 375.00 /lf | 121,875 |
| Epoxy backsplash | 635 lf | 60.00 /lf | 38,100 |
| Wall cabinets | 105 lf | 400.00 /lf | 42,000 |
| *E2010 Fixed Furnishings* | **136,600** *sf* | *12.84 /sf* | *1,754,375* |
| **E20 Furnishings** | **136,600 sf** | **12.84 /sf** | **1,754,375** |
| **E Equipment & Furnishings** | **136,600 sf** | **25.15 /sf** | **3,435,664** |
| **F Special Construction & Demolition** | | | |
| **F20 Demolition** | | | |
| **F2010 Building Elements Demolition** | | | |
| Building demolition | 195,400 sf | 7.00 /sf | 1,367,800 |
| *F2010 Building Elements Demolition* | **194,500** *sf* | *7.03 /sf* | *1,367,800* |
| **F2020 Hazardous Component Abatement** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **F2020 Hazardous Component Abatement** | | | |
| Asbestos abatement | 195,400 sf | 8.20 /sf | 1,602,280 |
| *F2020 Hazardous Component Abatement* | ***194,500 sf*** | *8.24 /sf* | *1,602,280* |
| **F20 Demolition** | **194,500 sf** | **15.27 /sf** | **2,970,080** |
| **F Special Construction & Demolition** | **194,500 sf** | **15.27 /sf** | **2,970,080** |

## G Sitework

### G10 Site Preparation

#### G1010 Site Clearing

| | | |
|---|---|---|
| *Mobilizations* | *BP#1* | */BP#1* |
| *Survey/layout* | *BP#1* | */BP#1* |
| *Police details* | *BP#1* | */BP#1* |
| *Precast Concrete Jersey Barriers for Temp. Parking Lot* | *BP#1* | */BP#1* |
| *Temporary site signage* | *BP#1* | */BP#1* |
| *As-built plan preparation* | *BP#1* | */BP#1* |
| *Localized dewatering* | *BP#1* | */BP#1* |
| *Clear & grub, vegetation removal* | *BP#1* | */BP#1* |
| *Strip & stockpile topsoil/loam* | *BP#1* | */BP#1* |
| *Construct Phase 2 Temp. Sediment Basins* | *BP#1* | */BP#1* |
| *SWPPP (Prep of SWPPP by civil engineer)* | *BP#1* | */BP#1* |
| *12"diameter Straw Wattles* | *BP#1* | */BP#1* |
| *Silt sacks at catch basin* | *BP#1* | */BP#1* |
| *Construction entrance* | *BP#1* | */BP#1* |
| *Street sweeping* | *BP#1* | */BP#1* |
| *Inspect / repair silt barrier weekly* | *BP#1* | */BP#1* |
| *Remove erosion control measure at project completion* | *BP#1* | */BP#1* |
| *Asphalt paving - Temp. Parking Layout* | *BP#1* | */BP#1* |
| *Temporary roads and maintenance required during construction* | *BP#1* | */BP#1* |
| *G1010 Site Clearing* | ***136,600 sf*** | */sf* |

#### G1020 Site Demolition & Relocations

| | | |
|---|---|---|
| *Demo hydrants* | *BP#1* | */BP#1* |
| *Demo bituminous concrete paving* | *BP#1* | */BP#1* |
| *Demo bituminous walk* | *BP#1* | */BP#1* |
| *Demo Temporary Bituminous Parking & Access Pavement* | *BP#1* | */BP#1* |
| *Demo concrete sidewalks/pads/ramps* | *BP#1* | */BP#1* |
| *Demo curbing* | *BP#1* | */BP#1* |
| *Cut & cap site utilities - water* | *BP#1* | */BP#1* |
| *Cut & cap site utilities - sewer* | *BP#1* | */BP#1* |
| *Demo utility piping - water* | *BP#1* | */BP#1* |
| *Demo utility piping - sewer* | *BP#1* | */BP#1* |

| Description | Takeoff Quantity | | Total Cost/Unit | | Total Amount |
|---|---|---|---|---|---|
| **G1020 Site Demolition & Relocations** | | | | | |
| *Demo utility piping - electrical* | *BP#1* | | */BP#1* | | |
| *Demo utility piping - drain* | *BP#1* | | */BP#1* | | |
| *Demo utility piping - gas* | *BP#1* | | */BP#1* | | |
| *Demo drain structures* | *BP#1* | | */BP#1* | | |
| *Demo grease trap* | *BP#1* | | */BP#1* | | |
| *Demo fencing/guardrail* | *BP#1* | | */BP#1* | | |
| *Misc. site demolition* | *BP#1* | | */BP#1* | | |
| *Demo utility poles* | *BP#1* | | */BP#1* | | |
| Flag pole | 1 | ea | 9,000.00 | /ea | 9,000 |
| *G1020 Site Demolition & Relocations* | **136,600** | *sf* | *0.07* | */sf* | *9,000* |
| **G1030 Site Earthwork** | | | | | |
| *Preconstruction survey and vibration monitoring & compliance* | *BP#1* | | */BP#1* | | |
| *Rough grading* | *BP#1* | | */BP#1* | | |
| *Fine grading - building SOG* | *BP#1* | | */BP#1* | | |
| *Fine grading - paving* | *BP#1* | | */BP#1* | | |
| *Fine grading - conc walks & site pads* | *BP#1* | | */BP#1* | | |
| *Fine grading - bituminous walks* | *BP#1* | | */BP#1* | | |
| *Cut to subgrade @ site* | *BP#1* | | */BP#1* | | |
| *Fill to subgrade from cut @ site* | *BP#1* | | */BP#1* | | |
| *Grind foundations for fill - In Demolition* | - | | */-* | | |
| *Fill to subgrade @ site - import* | *BP#1* | | */BP#1* | | |
| *Site cuts to stockpile for temporary parking & access layout* | *BP#1* | | */BP#1* | | |
| *Site surcharge* | *BP#1* | | */BP#1* | | |
| *Contaminated soil removal - unlined landfill* | *BP#1* | | */BP#1* | | |
| *Rock removal - NIC* | - | | */-* | | |
| Import loam & spread (6") at Lawns, Athletic Fields & Native Meadows | 5,594 | cy | 40.00 | /cy | 223,760 |
| Ammend & spread (6") at Lawns, Athletic Fields & Native Meadows | 6,030 | cy | 12.00 | /cy | 72,360 |
| Import loam & spread (6") at Detention Basins | 802 | cy | 40.00 | /cy | 32,080 |
| Import loam & spread (12") at Plant Beds | 375 | cy | 40.00 | /cy | 15,000 |
| Landscape Metal Edging at Building Mow Strip | 2,330 | lf | 15.00 | /lf | 34,950 |
| Building Mowing Strip- (Peastone) | 100 | tn | 50.00 | /tn | 5,000 |
| Import loam & spread (6") at Sodded Amphlitheather Lawns | 691 | cy | 40.00 | /cy | 27,640 |
| *G1030 Site Earthwork* | **136,600** | *sf* | *3.01* | */sf* | *410,790* |
| **G10 Site Preparation** | **136,600** | **sf** | **3.07** | **/sf** | **419,790** |
| **G20 Site Improvements** | | | | | |
| **G2010 Roadways** | | | | | |
| *Street plates for protection* | *BP#1* | | */BP#1* | | |

| Description | Takeoff Quantity | | Total Cost/Unit | | Total Amount |
|---|---|---|---|---|---|
| *G2010 Roadways* | **136,600** | *sf* | | */sf* | |
| **G2020 Parking Lots** | | | | | |
| *Gravel base course @ asphalt pavements* | | *BP#1* | | */BP#1* | |
| *Gravel base course @ Raised Stamped asphalt pavement at Flagg Drive* | | *BP#1* | | */BP#1* | |
| *1 1/2" crushed stone base course - concrete walks & site pads* | | *BP#1* | | */BP#1* | |
| *Asphalt paving - (Parking Lots & Site Drives)* | | *BP#1* | | */BP#1* | |
| *Asphalt paving - top course @ temporary to permanent* | | *BP#1* | | */BP#1* | |
| *Precast concrete curbs* | | *BP#1* | | */BP#1* | |
| *Vertical granite curbs* | | *BP#1* | | */BP#1* | |
| *Handicapped ramps at curbing* | | *BP#1* | | */BP#1* | |
| *Detectable Warning Plates at Handicapped Ramps* | | *BP#1* | | */BP#1* | |
| *Speed bumps - bituminous* | | *BP#1* | | */BP#1* | |
| *Pavement markings* | | *BP#1* | | */BP#1* | |
| *Parking signage* | | *BP#1* | | */BP#1* | |
| *G2020 Parking Lots* | **136,600** | *sf* | | */sf* | |
| **G2030 Pedestrian Paving** | | | | | |
| *Processed Aggregate base course - bituminous walks* | | *BP#1* | | */BP#1* | |
| *Concrete pavement* | | *BP#2* | | */BP#2* | |
| *Steps - premium* | | *BP#2* | | */BP#2* | |
| *Dumpster pad* | | *BP#2* | | */BP#2* | |
| *Concrete pavement with sawcut joints* | | *BP#2* | | */BP#2* | |
| *Stamped pavement at Flagg Drive* | | *BP#1* | | */BP#1* | |
| Pavers - plaza paving | 260 | sf | 25.00 | /sf | 6,500 |
| Stone Dust at Raised Planter | 32 | sf | 20.00 | /sf | 640 |
| *Bituminous sidewalks* | | *BP#1* | | */BP#1* | |
| *G2030 Pedestrian Paving* | **136,600** | *sf* | *0.05* | */sf* | *7,140* |
| **G2040 Site Development** | | | | | |
| *Retaining footing* | | *BP#2* | | */BP#2* | |
| *Retaining wall* | | *BP#2* | | */BP#2* | |
| *Concrete bench/seat wall* | | *BP#2* | | */BP#2* | |
| *Steel @ Bandshell - AESS* | | *BP#2* | | */BP#2* | |
| Guardrails - exterior, colorgalv | 240 | lf | 325.00 | /lf | 78,000 |
| Phenolic bench per A102A | 1 | ea | 4,200.00 | /ea | 4,200 |
| Glass @ Bandshell (vertical) - 9/16" tempered, laminated | 235 | sf | 150.00 | /sf | 35,250 |
| Glass @ Bandshell (roof) - 9/16" tempered, laminated | 300 | sf | 150.00 | /sf | 45,000 |
| Prep/paint Bandshell | 1 | ls | 10,000.00 | /ls | 10,000 |
| Prep/paint main and West Admin egress canopies | 1 | ls | 10,000.00 | /ls | 10,000 |
| *Exterior signage* | | *BP#1* | | */BP#1* | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **G2040 Site Development** | | | |
| Wood benches | 20 lf | 750.00 /lf | 15,000 |
| Bicycle Racks | 20 ea | 785.00 /ea | 15,700 |
| Basketball Poles & Hoops | 2 ea | 8,000.00 /ea | 16,000 |
| Miscellaneous site furnishings - Allowance | 1 ls | 30,000.00 /ls | 30,000 |
| *Gravel base course - misc site amenities- (i.e.- curbing, swales,etc.)* | *BP#1* | */BP#1* | |
| *Basketball Court Pavement- (3 1/2" Total Paving w/ Gravel Base) - BP#1* | *sf* | */sf* | |
| Basketball Court Pavement Markings | 1 ls | 2,000.00 /ls | 2,000 |
| *Wooden Guardrailing* | *BP#1* | */BP#1* | |
| *Fencing - N/A* | *-* | */-* | |
| 24' wide Single Arm Gate | 1 ea | 3,500.00 /ea | 3,500 |
| *Wooden Guardrailing - BP#1* | *lf* | */lf* | |
| *Bollards - 6" steel w/concrete - BP#1* | *BP#1* | */BP#1* | |
| *Bollards - 6" steel w/concrete - BP#1* | *ea* | */ea* | |
| *Bollards - architectural - VM-C01* | *0 ea* | */ea* | |
| Segmental retaining wall | 2,600 sf | 50.00 /sf | 130,000 |
| Additional segmental retaining wall per PR #12 | 220 sf | 50.00 /sf | 11,000 |
| *G2040 Site Development* | ***136,600*** *sf* | *2.97 /sf* | *405,650* |
| **G2050 Landscaping** | | | |
| Landscaping maintenance | 1 yr | 8,000.00 /yr | 8,000 |
| *Irrigation system @ south sports field - by others* | *-* | */-* | |
| Irrigation @ ampitheater - Allowance | 23,435 sf | 2.00 /sf | 46,870 |
| Irrigation system @ north sports field - Allowance | 81,000 sf | 2.00 /sf | 162,000 |
| Mulch at trees and planting beds (3") | 240 cy | 105.00 /cy | 25,200 |
| Fine grade & hydroseed lawn areas | 119,420 sf | 0.30 /sf | 35,826 |
| Fine grade & seed (Native Wildflower Meadow) | 104,005 sf | 0.25 /sf | 26,001 |
| Fine grade & seed (Detention Basin Mix- Hydroseed) | 33,330 sf | 0.25 /sf | 8,333 |
| Fine grade & seed (Natural Turf Fields) | 259,269 sf | 0.25 /sf | 64,817 |
| Sod (Amphiltheather Lawns) | 28,719 sf | 1.50 /sf | 43,079 |
| Watering for sod areas | 1 ls | 7,500.00 /ls | 7,500 |
| Sod (100'x170') | 17,000 sf | 1.50 /sf | 25,500 |
| Sod northeast - phase 3 play area | 5,000 sf | 1.50 /sf | 7,500 |
| Watering for sod areas | 1 ls | 7,500.00 /ls | 7,500 |
| Trees | 118 ea | 750.00 /ea | 88,500 |
| Shrubs (478 Total) | 7,736 sf | 8.50 /sf | 65,756 |
| Groundcover/perennials | 1,966 ea | 20.00 /ea | 39,320 |
| Planter Beds | 7,786 sf | 10.00 /sf | 77,860 |
| Rain garden | 8,275 sf | 10.00 /sf | 82,750 |
| *G2050 Landscaping* | ***136,600*** *sf* | *6.02 /sf* | *822,312* |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **G20 Site Improvements** | **136,600 sf** | **9.04 /sf** | **1,235,102** |
| **G30 Site Civil/Mechanical Utilites** | | | |
| **G3010 Water Supply** | | | |
| *Fire hydrants* | *BP#1* | */BP#1* | |
| *Fire hydrant - relocate existing* | *BP#1* | */BP#1* | |
| *Gate valves, tees, bends, thrust blocks, restraints* | *BP#1* | */BP#1* | |
| *Water distribution connections to existing* | *BP#1* | */BP#1* | |
| *Water line - domestic* | *BP#1* | */BP#1* | |
| *Water line - hydrant & fire services* | *BP#1* | */BP#1* | |
| *Pressure test & chlorinate* | *BP#1* | */BP#1* | |
| *G3010 Water Supply* | **136,600** *sf* | */sf* | |
| **G3020 Sanitary Sewer** | | | |
| *Sanitary sewer piping* | *BP#1* | */BP#1* | |
| *Sanitary sewer manholes* | *BP#1* | */BP#1* | |
| *Connect to existing structures* | *BP#1* | */BP#1* | |
| *Utility and sewer tie-in at trailer* | *BP#1* | */BP#1* | |
| *Sanitary sewer testing - piping* | *BP#1* | */BP#1* | |
| *Video inspect incoming sewer, etc.* | *BP#1* | */BP#1* | |
| *Sanitary sewer testing - structures* | *BP#1* | */BP#1* | |
| *Grease interceptor - In Plumbing* | *-* | */-* | |
| *Acid Neutralization - In Plumbing* | *-* | */-* | |
| *G3020 Sanitary Sewer* | **136,600** *sf* | */sf* | |
| **G3030 Storm Drainage** | | | |
| *Catch basins* | *BP#1* | */BP#1* | |
| *Granite Curb Inlets* | *BP#1* | */BP#1* | |
| *Storm drainage manholes* | *BP#1* | */BP#1* | |
| *Outlet control structures* | *BP#1* | */BP#1* | |
| *Storm headwalls* | *BP#1* | */BP#1* | |
| *Stormceptors* | *BP#1* | */BP#1* | |
| *Storm drainage piping* | *BP#1* | */BP#1* | |
| *Rip Rap Splash Pads* | *BP#1* | */BP#1* | |
| *Weir Overflows* | *BP#1* | */BP#1* | |
| *Check dams* | *BP#1* | */BP#1* | |
| *Foundation drainage piping* | *BP#1* | */BP#1* | |
| *Infiltration system* | *BP#1* | */BP#1* | |
| *G3030 Storm Drainage* | **136,600** *sf* | */sf* | |
| **G3060 Fuel Distribution** | | | |
| *Excavation / backfill for gas line* | *BP#1* | */BP#1* | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| *G3060 Fuel Distribution* | **136,600** *sf* | */sf* | |
| **G30 Site Civil/Mechanical Utilites** | **136,600 sf** | **/sf** | |
| **G40 Site Electrical Utilities** | | | |
| **G4010 Electrical Distribution** | | | |
| Temp power for welders | 2 ea | 2,398.27 /ea | 4,797 |
| Temp power for trailers | 4 ea | 1,302.42 /ea | 5,210 |
| Temp internet connection for trailers | 4 ea | 1,854.17 /ea | 7,417 |
| Feeder (PVC/CU) - 150A [generator / LS] | 135 lf | 22.18 /lf | 2,994 |
| Feeder (PVC/CU) - 225A [generator / OS] | 135 lf | 33.46 /lf | 4,517 |
| Feeder (PVC/CU) - 400A [generator / LR] (exterior) | 135 lf | 56.93 /lf | 7,685 |
| Feeder (PVC/CU) - 2500A [secondary] | 105 lf | 414.00 /lf | 43,470 |
| Empty conduit - sch 40 PVC: 1 x 4" [generator] | 135 lf | 9.86 /lf | 1,330 |
| Empty conduit - sch 40 PVC: 1 x 4" [secondary / spare] | 105 lf | 9.86 /lf | 1,035 |
| Empty conduit - sch 40 PVC: 2 x 4" [primary] | 250 lf | 17.66 /lf | 4,415 |
| Magnetic warning tape - 1/8" | 875 lf | 4.37 /lf | 3,826 |
| Pole riser (GRC - 4"C) | 2 ea | 2,343.85 /ea | 4,688 |
| Electric manhole - 6'x12x7' | 1 ea | 6,773.56 /ea | 6,774 |
| Cast iron manhole frame/cover, 32"D x 6'H grade rings | 1 ea | 1,140.93 /ea | 1,141 |
| 12" x 12" x 12"D ground mounted pullbox (Quazite #PC1212HG00 w/ Cover) | 2 ea | 752.15 /ea | 1,504 |
| Hand hole & cover - 4'x4'x4' | 6 ea | 1,937.11 /ea | 11,623 |
| 17"x30"x12"D ground pullbox (Quazite #PC1730BA12 w/ cover) | 11 ea | 1,078.60 /ea | 11,865 |
| 24" x 36" x 24"D ground mounted pullbox (Quazite #Pg2436BC-24 w/ Cover) | 1 ea | 1,718.39 /ea | 1,718 |
| Manhole / racking grounding & bonding | 1 ea | 701.05 /ea | 701 |
| Exterior (utility) transformer grounding & bonding | 1 ea | 1,066.05 /ea | 1,066 |
| Generator grounding & bonding | 1 ea | 1,066.05 /ea | 1,066 |
| Bare copper wire - #4/0 [duct bank] | 875 lf | 4.99 /lf | 4,368 |
| Electric vehicle charging station / dual pedestal / cable mgmt. | 3 ea | 10,512.40 /ea | 31,537 |
| Utility meter socket (meter by Util. Co.) | 1 ea | 289.66 /ea | 290 |
| CT meter enclosure for switchboard | 1 ea | 1,462.26 /ea | 1,462 |
| *Excavation/backfill for Emergency Generator ductbank* | *BP#1* | */BP#1* | |
| *Excavation/backfill for Primary Electric ductbank* | *BP#1* | */BP#1* | |
| *Excavation/backfill for Fire Alarm ductbank* | *BP#1* | */BP#1* | |
| *Excavation/backfill for Telcom ductbank* | *BP#1* | */BP#1* | |
| *Excavation/backfill for U.G. ductbank* | *BP#1* | */BP#1* | |
| *Excavation/backfill for 2"C Power Data ductbank (Amphitheather)* | *BP#1* | */BP#1* | |
| *Excavation/backfill for 2"C to IDF ductbank* | *BP#1* | */BP#1* | |
| *Concrete and rebar for electrical/telcom ductbanks* | *BP#1* | */BP#1* | |

| Description | Takeoff Quantity | | Total Cost/Unit | | Total Amount |
|---|---|---|---|---|---|
| **G4010 Electrical Distribution** | | | | | |
| *6" Concrete Filled Steel Pipe Bollards at Generator & Transformer Pads* | *BP#1* | | */BP#1* | | |
| *G4010 Electrical Distribution* | **136,600** | *sf* | *1.22* | */sf* | *166,498* |
| **G4020 Site Lighting** | | | | | |
| Remove existing exterior site light fixture | 11 | ea | 672.85 | /ea | 7,401 |
| Lighting contactor - 12 pole (exterior lighting) | 1 | ea | 1,899.98 | /ea | 1,900 |
| SL5: exterior ampitheater RGB projector, DMX capable, IP65 rated [O] | 8 | ea | 3,626.85 | /ea | 29,015 |
| SLS: LED recessed step light, 0-10V dimming capable [C] | 7 | ea | 732.90 | /ea | 5,130 |
| SL1: LED pole mounted luminaires mounted on a 20' pole [O] | 35 | ea | 2,891.40 | /ea | 101,199 |
| SL2A: exterior post top fixture with 15' round tapered alum pole [O] | 13 | ea | 5,492.50 | /ea | 71,403 |
| SL3: exterior bollard 43.3 cast illuminum [O] | 9 | ea | 1,929.78 | /ea | 17,368 |
| SL10: LED mini in-ground flood fixture capable of 0-10V dimming [O] | 12 | ea | 978.60 | /ea | 11,743 |
| EMT (12/2) - 20A | 1,400 | lf | 7.13 | /lf | 9,981 |
| 1" PVC - 30A (3#8 & #10G) | 6,900 | lf | 10.95 | /lf | 75,528 |
| 1" GRC - 90 Deg Sweep | 114 | ea | 174.22 | /ea | 19,861 |
| *Emergency Call Box base* | *BP#1* | | */BP#1* | | |
| *EV Parking Station bases* | *BP#1* | | */BP#1* | | |
| *Light pole bases* | *BP#1* | | */BP#1* | | |
| *G4020 Site Lighting* | **136,600** | *sf* | *2.57* | */sf* | *350,530* |
| **G4030 Site Communications & Security** | | | | | |
| Relocate existing emergency call box (provide new concrete base) | 1 | ea | 2,994.80 | /ea | 2,995 |
| Empty conduit (PVC) - 1" | 250 | lf | 8.07 | /lf | 2,016 |
| Empty conduit (PVC) - 2" | 700 | lf | 6.03 | /lf | 4,223 |
| Empty conduit (sch 40 PVC) (4) 4"C (CATV, Telephone, FIber, Spare) | 220 | lf | 32.32 | /lf | 7,110 |
| Three (3) 1.25" inner ducts for fiber | 220 | lf | 15.50 | /lf | 3,411 |
| Communications utility pole conduit riser (GRC - 4"C) | 4 | ea | 2,343.84 | /ea | 9,375 |
| Telecom manhole & cover - 4'x6'x7' | 1 | ea | 3,920.36 | /ea | 3,920 |
| 360-degree multi-sensor exterior cameras mounted on poles | 3 | ea | 4,509.56 | /ea | 13,529 |
| Camera wiring (PVC) | 600 | lf | 13.34 | /lf | 8,003 |
| Ductbank w/ IMSA cable - 2" PVC | 320 | lf | 16.30 | /lf | 5,217 |
| *Excavation/backfill for site lighting* | *BP#1* | | */BP#1* | | |
| *G4030 Site Communications & Security* | **136,600** | *sf* | *0.44* | */sf* | *59,799* |
| **G40 Site Electrical Utilities** | **136,600** | **sf** | **4.22** | **/sf** | **576,826** |
| **G Sitework** | **136,600** | **sf** | **16.34** | **/sf** | **2,231,718** |

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| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| 01-54 SCAFFOLDING | 136,600 sf | 0.55 /sf | 75,000 |
| 02-20 SELECTIVE DEMOLITION | 136,600 sf | 10.01 /sf | 1,367,800 |
| 02-82 HAZARDOUS MATERIAL ABATEMENT | 136,600 sf | 11.73 /sf | 1,602,280 |
| 03-30 CONCRETE | 136,600 sf | /sf | |
| 03-45 POLISHED CONCRETE | 136,600 sf | 0.24 /sf | 32,850 |
| 04-20 MASONRY (TS) | 136,600 sf | 16.81 /sf | 2,296,835 |
| 05-12 STRUCTURAL STEEL | 136,600 sf | /sf | |
| 05-50 MISCELLANEOUS METALS (TS) | 136,600 sf | 6.39 /sf | 873,350 |
| 06-25 FINISH CARPENTRY | 136,600 sf | 15.42 /sf | 2,106,225 |
| 07-10 WATERPROOFING & JOINT SEALANTS (TS) | 136,600 sf | 5.30 /sf | 723,860 |
| 07-42 METAL/COMPOSITE PANELS & SIDING | 136,600 sf | 8.66 /sf | 1,183,050 |
| 07-50 MEMBRANE ROOFING (TS) | 136,600 sf | 10.56 /sf | 1,442,347 |
| 07-81 FIREPROOFING | 136,600 sf | 2.94 /sf | 401,945 |
| 08-10 DOORS, FRAMES & HARDWARE | 136,600 sf | 5.21 /sf | 711,550 |
| 08-34 OVERHEAD DOORS & GRILLES | 136,600 sf | 0.55 /sf | 74,750 |
| 08-41 ALUMINUM STOREFRONT & WINDOWS (TS) | 136,600 sf | 17.23 /sf | 2,353,200 |
| 08-45 TRANSLUCENT PANEL SYSTEMS | 136,600 sf | 0.48 /sf | 66,000 |
| 08-80 GLASS & GLAZING (TS) | 136,600 sf | 7.84 /sf | 1,070,725 |
| 08-90 LOUVERS | 136,600 sf | 0.39 /sf | 53,125 |
| 09-21 DRYWALL | 136,600 sf | 48.08 /sf | 6,568,069 |
| 09-30 TILE (TS) | 136,600 sf | 1.61 /sf | 219,185 |
| 09-51 ACOUSTICAL CEILINGS (TS) | 136,600 sf | 6.91 /sf | 943,503 |
| 09-64 WOOD FLOORING | 136,600 sf | 1.55 /sf | 211,650 |
| 09-65 RESILIENT FLOORING (TS) | 136,600 sf | 7.61 /sf | 1,038,943 |
| 09-67 RESINOUS FLOORING | 136,600 sf | 0.59 /sf | 80,920 |
| 09-68 CARPET | 136,600 sf | 0.17 /sf | 23,475 |
| 09-90 PAINTING (TS) | 136,600 sf | 3.80 /sf | 518,523 |
| 10-14 SIGNAGE | 136,600 sf | 0.35 /sf | 47,810 |
| 10-24 OPERABLE PARTITIONS | 136,600 sf | 2.15 /sf | 293,545 |
| 10-51 LOCKERS | 136,600 sf | 3.14 /sf | 429,460 |
| 10-95 MISCELLANEOUS SPECIALTIES | 136,600 sf | 2.84 /sf | 387,827 |
| 11-31 RESIDENTIAL APPLIANCES | 136,600 sf | 0.20 /sf | 27,100 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| 11-40 FOOD SERVICE EQUIPMENT | 136,600 sf | 3.04 /sf | 415,270 |
| 11-51 AUDIO-VISUAL EQUIPMENT | 136,600 sf | 3.29 /sf | 450,000 |
| 11-61 THEATER & STAGE EQUIPMENT | 136,600 sf | 3.05 /sf | 416,921 |
| 11-65 ATHLETIC/RECREATIONAL EQUIPMENT | 136,600 sf | 0.68 /sf | 92,538 |
| 11-95 VOCATIONAL SHOP EQUIPMENT | 136,600 sf | 0.27 /sf | 37,000 |
| 12-20 WINDOW TREATMENTS | 136,600 sf | 1.12 /sf | 152,550 |
| 12-35 LAB CASEWORK | 136,600 sf | 2.04 /sf | 277,975 |
| 12-60 FIXED AUDITORIUM SEATING | 136,600 sf | 0.85 /sf | 115,710 |
| 12-62 BLEACHERS | 136,600 sf | 0.74 /sf | 100,750 |
| 14-20 ELEVATORS (TS) | 136,600 sf | 1.61 /sf | 220,000 |
| 21-01 FIRE PROTECTION (TS) | 136,600 sf | 6.70 /sf | 914,839 |
| 22-01 PLUMBING (TS) | 136,600 sf | 14.17 /sf | 1,935,182 |
| 23-01 HVAC (TS) | 136,600 sf | 58.17 /sf | 7,946,076 |
| 26-01 ELECTRICAL (TS) | 136,600 sf | 46.06 /sf | 6,291,566 |
| 31-23 SITEWORK | 136,600 sf | /sf | |
| 32-10 LANDSCAPING & SITE IMPROVEMENTS | 136,600 sf | 10.75 /sf | 1,468,942 |
| 32-31 FENCING | 136,600 sf | 0.03 /sf | 3,500 |

## Estimate Totals

| Description | Amount | Totals | Rate | Cost per Unit |
|---|---|---|---|---|
| Subtotal | **48,063,718** | **48,063,718** | | **351.86 /sf** |
| Design/Estimate Contingency | 1,441,912 | | 3.000 % | 10.56 /sf |
| Escalation | 495,056 | | 1.000 % | 3.62 /sf |
| **Subtotal** | **1,936,968** | **50,000,686** | | **366.04 /sf** |
| SDI (Non-Trade Contracts) | 269,858 | | 1.400 % | 1.98 /sf |
| Sub Bonds (Trade Contracts) | 403,034 | | 1.400 % | 2.95 /sf |
| Contractor's Contingency | 1,266,839 | | 2.500 % | 9.27 /sf |
| General Conditions | 2,931,033 | | | 21.46 /sf |
| General Requirements | 2,289,380 | | | 16.76 /sf |
| **Subtotal** | **7,160,144** | **57,160,830** | | **418.45 /sf** |
| Builder's Risk Insurance - BP1 | | | | |
| General Liability Insurance | 576,109 | | | 4.22 /sf |
| Building Permit - NIC | | | | |
| Performance & Payment Bond | | | | |
| **Subtotal** | **576,109** | **57,736,939** | | **422.67 /sf** |
| Fee | 1,152,218 | | | 8.43 /sf |
| Amendment #1 - Sitework | 10,957,843 | | | 80.22 /sf |
| Amendment #2 - Concrete & Steel | 8,716,894 | | | 63.81 /sf |
| Amendment #2 - Buy Savings | (50,755) | | | (0.37) /sf |
| **Total** | | **78,513,139** | | **574.77 /sf** |

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| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **01-54 SCAFFOLDING** | | | |
| **01.54.23 Temporary Scaffolding & Platforms** | | | |
| Dance floor at auditorium - multi-trade | 1 ls | 75,000.00 /ls | 75,000 |
| **Temporary Scaffolding & Platforms** | **136,600 sf** | **0.55 /sf** | **75,000** |
| **01-54 SCAFFOLDING** | **136,600 sf** | **0.55 /sf** | **75,000** |
| **02-20 SELECTIVE DEMOLITION** | | | |
| **02.41.01 Demolition - General** | | | |
| Building demolition | 195,400 sf | 7.00 /sf | 1,367,800 |
| **Demolition - General** | **136,600 sf** | **10.01 /sf** | **1,367,800** |
| **02-20 SELECTIVE DEMOLITION** | **136,600 sf** | **10.01 /sf** | **1,367,800** |
| **02-82 HAZARDOUS MATERIAL ABATEMENT** | | | |
| **02.82.00 Asbestos Remediation** | | | |
| Asbestos abatement | 195,400 sf | 8.20 /sf | 1,602,280 |
| **Asbestos Remediation** | **136,600 sf** | **11.73 /sf** | **1,602,280** |
| **02-82 HAZARDOUS MATERIAL ABATEMENT** | **136,600 sf** | **11.73 /sf** | **1,602,280** |
| **03-30 CONCRETE** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Concrete) | (1) ls | 116,000.00 /ls | (116,000) |
| Trade support - lull, laborer for cleanup (Concrete) | 1 ls | 116,000.00 /ls | 116,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **03.11.50 Concrete Forming - Flatwork** | | | |
| *Slab depressions* | *BP#2* | */BP#2* | |
| **Concrete Forming - Flatwork** | **135,589 sf** | **/sf** | |
| **03.11.75 Concrete Forming - Pits** | | | |
| *Elevator pit* | *BP#2* | */BP#2* | |
| **Concrete Forming - Pits** | **136,600 sf** | **/sf** | |
| **03.31.10 Concrete Ready Mix - Site** | | | |
| *Retaining footing* | *BP#2* | */BP#2* | |
| *Retaining wall* | *BP#2* | */BP#2* | |
| *Concrete bench/seat wall* | *BP#2* | */BP#2* | |
| **Concrete Ready Mix - Site** | **136,600 sf** | **/sf** | |
| **03.31.20 Concrete Ready Mix - Foundations** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **03.31.20 Concrete Ready Mix - Foundations** | | | |
| *F3 spread footings* | | *BP#2* | */BP#2* |
| *F4 spread footings* | | *BP#2* | */BP#2* |
| *F5 spread footings* | | *BP#2* | */BP#2* |
| *F6 spread footings* | | *BP#2* | */BP#2* |
| *F7 spread footings* | | *BP#2* | */BP#2* |
| *F8 spread footings* | | *BP#2* | */BP#2* |
| *F9 spread footings* | | *BP#2* | */BP#2* |
| *F10 spread footings* | | *BP#2* | */BP#2* |
| *F11 spread footings* | | *BP#2* | */BP#2* |
| *F12 spread footings* | | *BP#2* | */BP#2* |
| *Continuous footings - 3'x12"* | | *BP#2* | */BP#2* |
| *Continuous footings - 4'x12"* | | *BP#2* | */BP#2* |
| *Continuous footings - 5'x12" @ Bandshell* | | *BP#2* | */BP#2* |
| *Foundation walls - 16"* | | *BP#2* | */BP#2* |
| *Foundation walls - 16" @ Bandshell* | | *BP#2* | */BP#2* |
| *Foundation walls - 21"* | | *BP#2* | */BP#2* |
| *Retaining walls - 16"* | | *BP#2* | */BP#2* |
| *Concrete walls @ Auditorium* | | *BP#2* | */BP#2* |
| *Piers - 24"x24"* | | *BP#2* | */BP#2* |
| *Grade beam 1* | | *BP#2* | */BP#2* |
| *Grade beam 2* | | *BP#2* | */BP#2* |
| **Concrete Ready Mix - Foundations** | **136,600 sf** | | **/sf** |
| **03.31.50 Concrete Ready Mix - Flatwork** | | | |
| *Slab on grade - 5"* | | *BP#2* | */BP#2* |
| **Concrete Ready Mix - Flatwork** | **136,600 sf** | | **/sf** |
| **03.35.55 Concrete Finishing - Slabs-on-Grades** | | | |
| *Power trowel/seal concrete @ Auditorium* | | *BP#2* | */BP#2* |
| **Concrete Finishing - Slabs-on-Grades** | **136,600 sf** | | **/sf** |
| **03.35.60 Concrete Finishing - Slabs-on-Decking** | | | |
| *Place & finish slabs - 2-1/2" on 3" deck @ roof* | | *BP#2* | */BP#2* |
| *Place & finish slabs - 3-1/4" on 3" deck @ floor (LW)* | | *BP#2* | */BP#2* |
| *Topping slab @ Breakout LGMF floors* | | *BP#2* | */BP#2* |
| *Place & finish slabs - 3-1/4" on 3" deck @ roof* | | *BP#2* | */BP#2* |
| **Concrete Finishing - Slabs-on-Decking** | **136,600 sf** | | **/sf** |
| **03.35.90 Concrete Finishing - Miscellaneous** | | | |
| *Place & finish stair treads/landings* | | *BP#2* | */BP#2* |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Concrete Finishing - Miscellaneous** | **136,600 sf** | **/sf** | |
| **03.36.00 Miscellaneous Concrete Items** | | | |
| *Underslab insulation (perimeter only)* | *BP#2* | */BP#2* | |
| *Foundation wall insulation* | *BP#2* | */BP#2* | |
| **Miscellaneous Concrete Items** | **135,589 sf** | **/sf** | |
| **32.13.00 Rigid Paving** | | | |
| *Concrete pavement* | *BP#2* | */BP#2* | |
| *Steps - premium* | *BP#2* | */BP#2* | |
| *Dumpster pad* | *BP#2* | */BP#2* | |
| *Concrete pavement with sawcut joints* | *BP#2* | */BP#2* | |
| **Rigid Paving** | **136,600 sf** | **/sf** | |
| **03-30 CONCRETE** | **136,600 sf** | **/sf** | |
| **03-45 POLISHED CONCRETE** | | | |
| **03.36.00 Miscellaneous Concrete Items** | | | |
| Polished concrete @ Auditorium | 3,650 sf | 9.00 /sf | 32,850 |
| **Miscellaneous Concrete Items** | **136,600 sf** | **0.24 /sf** | **32,850** |
| **03-45 POLISHED CONCRETE** | **136,600 sf** | **0.24 /sf** | **32,850** |
| **04-20 MASONRY (TS)** | | | |
| **01.43.00 Quality Assurance** | | | |
| Exterior wall mockup - Masonry, Allowance | 1 allw | 7,500.00 /allw | 7,500 |
| **Quality Assurance** | **136,600 sf** | **0.06 /sf** | **7,500** |
| **01.54.23 Temporary Scaffolding & Platforms** | | | |
| Temporary bracing of CMU @ Gym and Auditorium | 1 ls | 100,000.00 /ls | 100,000 |
| Exterior staging | 40,145 sf | 2.50 /sf | 100,363 |
| **Temporary Scaffolding & Platforms** | **136,600 sf** | **1.47 /sf** | **200,363** |
| **01.56.50 Winter Conditions** | | | |
| Masonry winter conditions/heat | 12 wks | 5,000.00 /wks | 60,000 |
| **Winter Conditions** | **136,600 sf** | **0.44 /sf** | **60,000** |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Masonry) | (1) ls | 77,000.00 /ls | (77,000) |
| Trade support - lull, laborer for cleanup (Masonry) | 1 ls | 77,000.00 /ls | 77,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **03.45.00 Precast Architectural Concrete** | | | |
| Precast planters | 25 lf | 750.00 /lf | 18,750 |
| **Precast Architectural Concrete** | **136,600 sf** | **0.14 /sf** | **18,750** |
| **04.05.23 Masonry Accessories** | | | |
| Install loose lintels (< 8") | 14 ea | 150.00 /ea | 2,100 |
| **Masonry Accessories** | **136,600 sf** | **0.02 /sf** | **2,100** |
| **04.21.13 Brick Masonry - Veneer** | | | |
| 4x4x12 iron spot brick veneer, scored | 6,815 sf | 36.00 /sf | 245,340 |
| 4x8x8 iron spot brick veneer, scored | 6,750 sf | 36.00 /sf | 243,000 |
| *Brick veneer - interior - N/A* | - | /- | |
| Brick veneer, precast cap @ entry wall per A102A | 25 lf | 285.00 /lf | 7,125 |
| **Brick Masonry - Veneer** | **136,600 sf** | **3.63 /sf** | **495,465** |
| **04.22.00 Concrete Unit Masonry** | | | |
| 4x4x12 scored ground faced CMU veneer | 2,970 sf | 27.00 /sf | 80,190 |
| 4x8x16 scored ground faced CMU veneer | 23,615 sf | 29.00 /sf | 684,835 |
| CMU - 12" exterior wall | 15,795 sf | 25.00 /sf | 394,875 |
| CMU - 12" interior wall | 6,890 sf | 25.00 /sf | 172,250 |
| CMU - ground face block, premium | 1 ls | 35,000.00 /ls | 35,000 |
| CMU - acoustical block, premium | 1 ls | 5,000.00 /ls | 5,000 |
| **Concrete Unit Masonry** | **136,600 sf** | **10.05 /sf** | **1,372,150** |
| **07.21.00 Thermal Insulation** | | | |
| Mineral wool insulation at brick/CMU veneer | 40,145 sf | 3.50 /sf | 140,508 |
| **Thermal Insulation** | **136,600 sf** | **1.03 /sf** | **140,508** |
| **04-20 MASONRY (TS)** | **136,600 sf** | **16.81 /sf** | **2,296,835** |
| **05-12 STRUCTURAL STEEL** | | | |
| **01.43.00 Quality Assurance** | | | |
| *Exterior wall mockup - Steel, Allowance* | *BP#2* | */BP#2* | |
| **Quality Assurance** | **136,600 sf** | **/sf** | |
| **05.05.23 Metal Fastenings** | | | |
| *Moment connections @ floor* | *BP#2* | */BP#2* | |
| *Moment connections @ roof* | *BP#2* | */BP#2* | |
| **Metal Fastenings** | **136,600 sf** | **/sf** | |
| **05.12.00 Structural Steel Framing** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **05.12.00 Structural Steel Framing** | | | |
| *Steel @ floors* | *BP#2* | */BP#2* | |
| *Steel hangers - AESS* | *BP#2* | */BP#2* | |
| *Steel @ floors - VM-S05* | *BP#2* | */BP#2* | |
| *Steel @ screen wall - galvanized* | *BP#2* | */BP#2* | |
| *Steel @ Bandshell - AESS* | *BP#2* | */BP#2* | |
| *Steel @ Canopy - AESS* | *BP#2* | */BP#2* | |
| *Steel @ roof* | *BP#2* | */BP#2* | |
| *Steel dunnage - RTU & chiller* | *BP#2* | */BP#2* | |
| *Relieving angles @ brick veneer* | *BP#2* | */BP#2* | |
| *Shoring @ Learning Commons* | *BP#2* | */BP#2* | |
| **Structural Steel Framing** | **136,600 sf** | **/sf** | |
| **05.20.00 Metal Joists** | | | |
| *Open web joists, bridging* | *BP#2* | */BP#2* | |
| **Metal Joists** | **136,600 sf** | **/sf** | |
| **05.30.00 Metal Decking** | | | |
| *Metal floor decking - galvanized (3" 18g)* | *BP#2* | */BP#2* | |
| *Metal roof decking - acoustical (3" 18/16g)* | *BP#2* | */BP#2* | |
| *Metal floor decking @ Breakout room LGMF floors* | *BP#2* | */BP#2* | |
| *Metal roof decking - galvanized (1-1/2" 20g)* | *BP#2* | */BP#2* | |
| *Metal roof decking - acoustical (1-1/2" 20g)* | *BP#2* | */BP#2* | |
| *Metal roof decking - galvanized (3" 18g)* | *BP#2* | */BP#2* | |
| **Metal Decking** | **136,600 sf** | **/sf** | |
| **05.51.00 Metal Stairs** | | | |
| *Ornamental stairs 4 and 5 - excluding rails* | *BP#2* | */BP#2* | |
| **Metal Stairs** | **136,600 sf** | **/sf** | |
| **05.52.00 Metal Railings** | | | |
| *Steel angles/stantions @ locker guardrail* | *BP#2* | */BP#2* | |
| **Metal Railings** | **136,600 sf** | **/sf** | |
| **05-12 STRUCTURAL STEEL** | **136,600 sf** | **/sf** | |
| **05-50 MISCELLANEOUS METALS (TS)** | | | |
| **05.50.00 Metal Fabrications** | | | |
| Misc. metal fabrications | 136,600 sf | 1.00 /sf | 136,600 |
| Seismic clips - 4' OC, each side | 270 ea | 60.00 /ea | 16,200 |
| Loose lintels - Furnish | 95 lf | 25.00 /lf | 2,375 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Metal Fabrications** | **136,600 sf** | **1.14 /sf** | **155,175** |
| **05.51.00 Metal Stairs** | | | |
| Ornamental stairs 3 and 6 - excluding rails | 2 flt | 60,000.00 /flt | 120,000 |
| Egress stair | 5 flt | 20,000.00 /flt | 100,000 |
| Roof ladders | 3 ea | 1,500.00 /ea | 4,500 |
| Elevator pit ladders | 1 ea | 450.00 /ea | 450 |
| **Metal Stairs** | **136,600 sf** | **1.65 /sf** | **224,950** |
| **05.52.00 Metal Railings** | | | |
| Handrail @ steps/ramps | 55 lf | 295.00 /lf | 16,225 |
| Cane rails | 120 lf | 200.00 /lf | 24,000 |
| Guardrails @ Atrium | 380 lf | 500.00 /lf | 190,000 |
| Guardrails @ Atrium stairs | 235 lf | 500.00 /lf | 117,500 |
| Guardrails - 42" galvanized perforated @ exterior | 105 lf | 500.00 /lf | 52,500 |
| Guardrails - 42" galvanized perforated @ terrace | 30 lf | 500.00 /lf | 15,000 |
| Guardrails - exterior, colorgalv | 240 lf | 325.00 /lf | 78,000 |
| **Metal Railings** | **136,600 sf** | **3.61 /sf** | **493,225** |
| **05-50 MISCELLANEOUS METALS (TS)** | **136,600 sf** | **6.39 /sf** | **873,350** |
| **06-25 FINISH CARPENTRY** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Finish Carpentry) | (1) ls | 72,000.00 /ls | (72,000) |
| Trade support - lull, laborer for cleanup (Finish Carpentry) | 1 ls | 72,000.00 /ls | 72,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **06.20.23 Interior Finish Carpentry** | | | |
| Wood base | 100 lf | 25.00 /lf | 2,500 |
| Miscellaneous wood base/trim | 136,600 sf | 0.50 /sf | 68,300 |
| Trim @ Breakout D glass lights | 320 sf | 25.00 /sf | 8,000 |
| Window sills - P-lam | 1,100 lf | 25.00 /lf | 27,500 |
| Hardwood trim @ locker guardrail per A650 | 3,300 lf | 15.00 /lf | 49,500 |
| **Interior Finish Carpentry** | **136,600 sf** | **1.14 /sf** | **155,800** |
| **06.25.00 Prefinished Paneling** | | | |
| P-lam panel | 1,440 sf | 45.00 /sf | 64,800 |
| P-lam panel on Z-clips @ Breakout | 325 sf | 45.00 /sf | 14,625 |
| Suspended P-lam clouds @ Auditorium | 100 ea | 2,000.00 /ea | 200,000 |
| P-lam top panels @ locker guardrail per A650 | 1,025 lf | 50.00 /lf | 51,250 |
| P-lam side panels @ locker guardrail per A650 | 450 lf | 50.00 /lf | 22,500 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **06.25.00 Prefinished Paneling** | | | |
| P-lam panel backsplash | 120 sf | 45.00 /sf | 5,400 |
| Marker tray - bamboo | 2,485 lf | 30.00 /lf | 74,550 |
| Casework for lockers (bank of 5) - including base | 1,025 lf | 250.00 /lf | 256,250 |
| MDF bumper rail | 3,715 lf | 25.00 /lf | 92,875 |
| P-lam wall panels - sound reflecting @ Auditorium | 2,925 sf | 45.00 /sf | 131,625 |
| P-lam wall panels - vestibules | 400 sf | 45.00 /sf | 18,000 |
| P-lam projector enclosure @ Auditorium | 1 ea | 2,500.00 /ea | 2,500 |
| **Prefinished Paneling** | **136,600 sf** | **6.84 /sf** | **934,375** |
| **06.41.00 Architectural Wood Casework** | | | |
| P-lam base cabinet w/top | 40 lf | 450.00 /lf | 18,000 |
| P-lam workstation w/top | 770 lf | 250.00 /lf | 192,500 |
| Mobile storage | 172 ea | 550.00 /ea | 94,600 |
| P-lam valance for fin tube | 570 lf | 45.00 /lf | 25,650 |
| P-lam 3/4" lip at counter for fin tube | 570 lf | 4.00 /lf | 2,280 |
| P-lam wall cabinet | 40 lf | 325.00 /lf | 13,000 |
| P-lam full height cabinet | 50 lf | 700.00 /lf | 35,000 |
| Bathroom vanity w/top | 210 lf | 250.00 /lf | 52,500 |
| Reception cabinet | 20 lf | 1,000.00 /lf | 20,000 |
| P-lam circulation desk | 10 lf | 750.00 /lf | 7,500 |
| P-lam work counter @ Admin | 10 lf | 1,500.00 /lf | 15,000 |
| P-lam counter @ Servery | 32 lf | 200.00 /lf | 6,400 |
| P-lam end/filler panels @ Admin | 10 lf | 135.00 /lf | 1,350 |
| Mailboxes | 18 lf | 415.00 /lf | 7,470 |
| Storage shelving | 380 lf | 150.00 /lf | 57,000 |
| Storage shelving w/MDF | 470 lf | 200.00 /lf | 94,000 |
| P-lam bookcases | 40 lf | 500.00 /lf | 20,000 |
| Built-in benches | 205 lf | 600.00 /lf | 123,000 |
| Display cases | 5 ea | 4,500.00 /ea | 22,500 |
| Misc. casework - Allowance | 136,600 sf | 1.00 /sf | 136,600 |
| Phenolic bench per A102A | 1 ea | 4,200.00 /ea | 4,200 |
| Wood louvered shades - Rulon panel grille | 450 lf | 150.00 /lf | 67,500 |
| **Architectural Wood Casework** | **136,600 sf** | **7.44 /sf** | **1,016,050** |
| **06-25 FINISH CARPENTRY** | **136,600 sf** | **15.42 /sf** | **2,106,225** |

## 07-10 WATERPROOFING & JOINT SEALANTS (TS)

| | | | |
|---|---|---|---|
| **01.43.00 Quality Assurance** | | | |
| Exterior wall mockup - Waterproofing, Allowance | 1 allw | 5,000.00 /allw | 5,000 |

| Description | Takeoff Quantity | | Total Cost/Unit | | Total Amount |
|---|---|---|---|---|---|
| **Quality Assurance** | **136,600** | **sf** | **0.04** | **/sf** | **5,000** |
| **01.74.00 Cleaning & Waste Management** | | | | | |
| Lull, laborer for cleanup by Consigli (Waterproofing) | (1) | ls | 29,000.00 | /ls | (29,000) |
| Trade support - lull, laborer for cleanup (Waterproofing) | 1 | ls | 29,000.00 | /ls | 29,000 |
| **Cleaning & Waste Management** | **136,600** | **sf** | | **/sf** | |
| **07.10.00 Dampproofing & Waterproofing** | | | | | |
| Caulking @ storefront/curtainwall | 7,425 | lf | 4.00 | /lf | 29,700 |
| Caulking & sealants @ interior | 136,600 | sf | 0.90 | /sf | 122,940 |
| *Dampproofing at foundation wall* | | *BP#2* | | */BP#2* | |
| Misc. caulking & sealants @ exterior | 73,210 | sf | 0.75 | /sf | 54,908 |
| *Foundation wall waterproofing - membrane w/ drainage board* | | *BP#2* | | */BP#2* | |
| *Elevator pit waterproofing - cementitious* | | *BP#2* | | */BP#2* | |
| **Dampproofing & Waterproofing** | **136,600** | **sf** | **1.52** | **/sf** | **207,548** |
| **07.26.00 Vapor Retarders** | | | | | |
| Air and vapor barrier @ exterior walls | 56,650 | sf | 7.50 | /sf | 424,875 |
| Air and vapor barrier @ soffits | 1,245 | sf | 7.50 | /sf | 9,338 |
| Air and vapor barrier @ phenolic fins per A102A, A315 | 380 | sf | 7.50 | /sf | 2,850 |
| Window transitions | 7,425 | lf | 10.00 | /lf | 74,250 |
| **Vapor Retarders** | **136,600** | **sf** | **3.74** | **/sf** | **511,313** |
| **07-10 WATERPROOFING & JOINT SEALANTS (TS)** | **136,600** | **sf** | **5.30** | **/sf** | **723,860** |
| **07-42 METAL/COMPOSITE PANELS & SIDING** | | | | | |
| **01.43.00 Quality Assurance** | | | | | |
| Exterior wall mockup - Siding, Allowance | 1 | allw | 10,000.00 | /allw | 10,000 |
| **Quality Assurance** | **136,600** | **sf** | **0.07** | **/sf** | **10,000** |
| **01.74.00 Cleaning & Waste Management** | | | | | |
| Lull, laborer for cleanup by Consigli (Siding) | (1) | ls | 48,000.00 | /ls | (48,000) |
| Trade support - lull, laborer for cleanup (Siding) | 1 | ls | 48,000.00 | /ls | 48,000 |
| **Cleaning & Waste Management** | **136,600** | **sf** | | **/sf** | |
| **07.42.00 Wall Panels** | | | | | |
| Corrugated, perforated metal siding @ screen walls | 1,105 | sf | 45.00 | /sf | 49,725 |
| Exposed fastener metal panel | 6,065 | sf | 45.00 | /sf | 272,925 |
| Composite metal panel siding | 3,120 | sf | 75.00 | /sf | 234,000 |
| Phenolic panel siding | 7,705 | sf | 80.00 | /sf | 616,400 |
| **Wall Panels** | **136,600** | **sf** | **8.59** | **/sf** | **1,173,050** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **07-42 METAL/COMPOSITE PANELS & SIDING** | **136,600 sf** | **8.66 /sf** | **1,183,050** |
| **07-50 MEMBRANE ROOFING (TS)** | | | |
| **01.43.00 Quality Assurance** | | | |
| Exterior wall mockup - Roofing, Allowance | 1 allw | 2,500.00 /allw | 2,500 |
| **Quality Assurance** | **136,600 sf** | **0.02 /sf** | **2,500** |
| **07.50.00 Membrane Roofing** | | | |
| PVC membrane roof w/insulation, underlayment, cover board, vapor barrier | 63,155 sf | 18.25 /sf | 1,152,579 |
| PVC membrane @ walls | 2,740 sf | 20.25 /sf | 55,485 |
| Reinforced walkway pads | 715 sf | 7.50 /sf | 5,363 |
| Pavers - terrace | 295 sf | 35.00 /sf | 10,325 |
| Pavers - main entrance | 780 sf | 35.00 /sf | 27,300 |
| **Membrane Roofing** | **136,600 sf** | **9.16 /sf** | **1,251,051** |
| **07.72.00 Roof Accessories** | | | |
| Roof accessories | 63,155 sf | 0.35 /sf | 22,104 |
| Roof vents & hatches | 1 ls | 25,000.00 /ls | 25,000 |
| Metal roof facia | 2,695 lf | 35.00 /lf | 94,325 |
| Additional flashing, scuppers | 63,155 sf | 0.75 /sf | 47,366 |
| **Roof Accessories** | **136,600 sf** | **1.38 /sf** | **188,796** |
| **07-50 MEMBRANE ROOFING (TS)** | **136,600 sf** | **10.56 /sf** | **1,442,347** |
| **07-81 FIREPROOFING** | | | |
| **07.81.00 Applied Fireproofing** | | | |
| Sprayed fireproofing - steel beams and columns @ floor structure | 64,740 sf | 3.00 /sf | 194,220 |
| Sprayed fireproofing - steel beams and columns @ roof structure below 20' | 33,575 sf | 3.00 /sf | 100,725 |
| Patch Sprayed fireproofing - floor structure | 5 days | 3,500.00 /days | 17,500 |
| Patch Sprayed fireproofing - roof structure | 5 days | 3,500.00 /days | 17,500 |
| Intumescent fireproofing @ Learning Commons | 1 ls | 72,000.00 /ls | 72,000 |
| **Applied Fireproofing** | **136,600 sf** | **2.94 /sf** | **401,945** |
| **07-81 FIREPROOFING** | **136,600 sf** | **2.94 /sf** | **401,945** |
| **08-10 DOORS, FRAMES & HARDWARE** | | | |
| **08.10.05 Doors & Frames** | | | |
| Install exterior door, HW | 14 ea | 300.00 /ea | 4,200 |
| Install interior door, HW | 300 ea | 300.00 /ea | 90,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Doors & Frames** | **136,600 sf** | **0.69 /sf** | **94,200** |
| **08.11.13 Hollow Metal Doors & Frames** | | | |
| HM doors - interior - flush | 45 lvs | 310.00 /lvs | 13,950 |
| HM doors - exterior flush | 23 lvs | 625.00 /lvs | 14,375 |
| HM frames - exterior single | 5 ea | 255.00 /ea | 1,275 |
| HM frames - exterior double | 9 ea | 440.00 /ea | 3,960 |
| HM frames - interior single | 258 ea | 310.00 /ea | 79,980 |
| HM frames - interior single, tandem | 13 ea | 360.00 /ea | 4,680 |
| HM frames - interior double | 29 ea | 385.00 /ea | 11,165 |
| **Hollow Metal Doors & Frames** | **136,600 sf** | **0.95 /sf** | **129,385** |
| **08.14.00 Wood Doors** | | | |
| Wood door - interior flush | 297 lvs | 390.00 /lvs | 115,830 |
| Fire rated wood doors - premium | 44 lvs | 390.00 /lvs | 17,160 |
| Acoustical doors (STC 45) - premium | 1 ls | 15,000.00 /ls | 15,000 |
| **Wood Doors** | **136,600 sf** | **1.08 /sf** | **147,990** |
| **08.71.00 Door Hardware** | | | |
| Hardware sets - exterior door/panic | 14 set | 1,920.01 /set | 26,880 |
| Hardware sets - auto operators | 1 set | 4,500.00 /set | 4,500 |
| Hardware sets - standard interior | 287 set | 1,015.00 /set | 291,305 |
| Hardware sets - interior, tandem | 13 set | 1,330.00 /set | 17,290 |
| **Door Hardware** | **136,600 sf** | **2.49 /sf** | **339,975** |
| **08-10 DOORS, FRAMES & HARDWARE** | **136,600 sf** | **5.21 /sf** | **711,550** |
| **08-34 OVERHEAD DOORS & GRILLES** | | | |
| **08.33.00 Coiling Doors & Grilles** | | | |
| Coiling security screen - 4' high, manual | 85 sf | 70.00 /sf | 5,950 |
| Coiling security screen - 8' high, manual | 690 sf | 70.00 /sf | 48,300 |
| Custom security gate @ Learning Commons | 2 lvs | 6,000.00 /lvs | 12,000 |
| **Coiling Doors & Grilles** | **136,600 sf** | **0.49 /sf** | **66,250** |
| **08.36.00 Panel Doors** | | | |
| Overhead coiling door | 1 ea | 7,500.00 /ea | 7,500 |
| **Panel Doors** | **136,600 sf** | **0.06 /sf** | **7,500** |
| **11.13.00 Loading Dock Equipment** | | | |
| Loading dock equipment | 1 ls | 1,000.00 /ls | 1,000 |
| **Loading Dock Equipment** | **136,600 sf** | **0.01 /sf** | **1,000** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **08-34 OVERHEAD DOORS & GRILLES** | **136,600 sf** | **0.55 /sf** | **74,750** |
| **08-41 ALUMINUM STOREFRONT & WINDOWS (TS)** | | | |
| **01.43.00 Quality Assurance** | | | |
| Exterior wall mockup - Windows, Allowance | 1 allw | 20,000.00 /allw | 20,000 |
| **Quality Assurance** | **136,600 sf** | **0.15 /sf** | **20,000** |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Windows) | (1) ls | 73,000.00 /ls | (73,000) |
| Trade support - lull, laborer for cleanup (Windows) | 1 ls | 73,000.00 /ls | 73,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **08.41.00 Entrances & Storefronts** | | | |
| Aluminum storefront/windows | 11,555 sf | 100.00 /sf | 1,155,500 |
| Aluminum storefront - School Guard | 545 sf | 140.00 /sf | 76,300 |
| Extruded aluminum perimeter angles | 7,425 lf | 30.00 /lf | 222,750 |
| Aluminum entrance doors, HW - exterior | 4 lvs | 6,000.00 /lvs | 24,000 |
| Aluminum entrance doors, HW - exterior, School Guard | 11 lvs | 7,000.00 /lvs | 77,000 |
| **Entrances & Storefronts** | **136,600 sf** | **11.39 /sf** | **1,555,550** |
| **08.63.00 Metal-Framed Skylights** | | | |
| Metal-framed skylights (8:12) | 4,130 sf | 150.00 /sf | 619,500 |
| Metal-framed skylights gable ends | 490 sf | 150.00 /sf | 73,500 |
| **Metal-Framed Skylights** | | **/sf** | **693,000** |
| **08.71.00 Door Hardware** | | | |
| Automatic operators | 1 pair | 4,400.00 /pair | 4,400 |
| **Door Hardware** | **136,600 sf** | **0.03 /sf** | **4,400** |
| **08.80.00 Glazing** | | | |
| Glass @ Bandshell (vertical) - 9/16" tempered, laminated | 235 sf | 150.00 /sf | 35,250 |
| Glass @ Bandshell (roof) - 9/16" tempered, laminated | 300 sf | 150.00 /sf | 45,000 |
| **Glazing** | **135,589 sf** | **0.59 /sf** | **80,250** |
| **08-41 ALUMINUM STOREFRONT & WINDOWS (TS)** | **136,600 sf** | **17.23 /sf** | **2,353,200** |
| **08-45 TRANSLUCENT PANEL SYSTEMS** | | | |
| **08.45.00 Translucent Wall & Roof Assemblies** | | | |
| Polycarbonate glazing @ canopy | 440 sf | 150.00 /sf | 66,000 |
| **Translucent Wall & Roof Assemblies** | **136,600 sf** | **0.48 /sf** | **66,000** |
| **08-45 TRANSLUCENT PANEL SYSTEMS** | **136,600 sf** | **0.48 /sf** | **66,000** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **08-80 GLASS & GLAZING (TS)** | | | |
| **08.41.00 Entrances & Storefronts** | | | |
| Aluminum storefront - interior, School Guard | 340 sf | 140.00 /sf | 47,600 |
| Aluminum windows - interior, School Guard | 2 ea | 12,000.00 /ea | 24,000 |
| Aluminum entrance doors, HW - interior | 1 lvs | 6,000.00 /lvs | 6,000 |
| Aluminum entrance doors, HW - interior, School Guard | 8 lvs | 7,000.00 /lvs | 56,000 |
| **Entrances & Storefronts** | **136,600 sf** | **0.98 /sf** | **133,600** |
| **08.80.00 Glazing** | | | |
| Misc. interior glass & glazing | 136,600 sf | 0.25 /sf | 34,150 |
| Glazed partition | 4,700 sf | 60.00 /sf | 282,000 |
| Glazed partition - double acoustic | 625 sf | 110.00 /sf | 68,750 |
| Glazed partition @ sidelights | 1,165 sf | 75.00 /sf | 87,375 |
| Glass walls @ Breakout | 2,005 sf | 120.00 /sf | 240,600 |
| Glass roof @ Breakout | 70 sf | 150.00 /sf | 10,500 |
| Door glazing - full | 159 ea | 400.00 /ea | 63,600 |
| Door glazing - narrow | 2 ea | 100.00 /ea | 200 |
| Mirrors - unframed restroom | 1,145 sf | 35.00 /sf | 40,075 |
| **Glazing** | **136,600 sf** | **6.06 /sf** | **827,250** |
| **08.88.00 Glazing Surface Films** | | | |
| Graduated glass film | 3,675 sf | 5.00 /sf | 18,375 |
| 3M Safety and Security Window Film @ glass walls | 4,090 sf | 15.00 /sf | 61,350 |
| 3M Safety and Security Window Film @ doors | 67 lvs | 450.00 /lvs | 30,150 |
| **Glazing Surface Films** | **136,600 sf** | **0.80 /sf** | **109,875** |
| **08-80 GLASS & GLAZING (TS)** | **136,600 sf** | **7.84 /sf** | **1,070,725** |
| **08-90 LOUVERS** | | | |
| **08.90.00 Louvers & Vents** | | | |
| Metal louver | 625 sf | 85.00 /sf | 53,125 |
| **Louvers & Vents** | **136,600 sf** | **0.39 /sf** | **53,125** |
| **08-90 LOUVERS** | **136,600 sf** | **0.39 /sf** | **53,125** |
| **09-21 DRYWALL** | | | |
| **01.43.00 Quality Assurance** | | | |
| Exterior wall mockup - Drywall, Allowance | 1 allw | 10,000.00 /allw | 10,000 |
| **Quality Assurance** | **136,600 sf** | **0.07 /sf** | **10,000** |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Drywall) | (1) ls | 188,000.00 /ls | (188,000) |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **01.74.00 Cleaning & Waste Management** | | | |
| Trade support - lull, laborer for cleanup (Drywall) | 1 ls | 188,000.00 /ls | 188,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **05.40.00 Cold-Formed Metal Framing** | | | |
| Light gage metal framing @ Breakout floors | 1,440 sf | 60.00 /sf | 86,400 |
| Light gage metal framing @ Breakout walls | 16,820 sf | 25.00 /sf | 420,500 |
| **Cold-Formed Metal Framing** | **136,600 sf** | **3.71 /sf** | **506,900** |
| **06.10.00 Rough Carpentry** | | | |
| Roof blocking | 10,780 lf | 32.00 /lf | 344,960 |
| Window blocking | 7,425 lf | 12.75 /lf | 94,669 |
| Door blocking - exterior | 265 lf | 13.85 /lf | 3,671 |
| Door blocking - interior | 4,965 lf | 13.85 /lf | 68,772 |
| In-wall blocking | 12,160 lf | 12.75 /lf | 155,040 |
| Miscellaneous rough carpentry - Allowance | 136,600 sf | 0.65 /sf | 88,790 |
| **Rough Carpentry** | **136,600 sf** | **5.53 /sf** | **755,902** |
| **07.84.00 Firestopping** | | | |
| Firestopping @ rated walls | 5,630 lf | 16.20 /lf | 91,206 |
| Miscellaneous firestopping | 136,600 sf | 0.10 /sf | 13,660 |
| **Firestopping** | **136,600 sf** | **0.77 /sf** | **104,866** |
| **08.31.00 Access Doors & Panels** | | | |
| Access panels | 1 ls | 15,000.00 /ls | 15,000 |
| **Access Doors & Panels** | **136,600 sf** | **0.11 /sf** | **15,000** |
| **09.21.13 Gypsum Board Assemblies - Walls** | | | |
| Level 5 finish - Allowance | 25,000 sf | 2.55 /sf | 63,750 |
| Interior wall framing - 2-1/2" | 3,370 sf | 5.75 /sf | 19,378 |
| Interior wall framing - 3-5/8"/4" | 96,355 sf | 5.75 /sf | 554,041 |
| Interior wall framing - 6" | 7,050 sf | 7.65 /sf | 53,933 |
| Interior wall framing - 8" | 21,965 sf | 10.15 /sf | 222,945 |
| Interior wall framing - 10" | 555 sf | 12.10 /sf | 6,716 |
| GWB - 5/8", level 4 | 229,230 sf | 4.15 /sf | 951,305 |
| GWB - 5/8", additional layer | 96,320 sf | 3.50 /sf | 336,627 |
| GWB - high impact | 1 ls | 50,000.00 /ls | 50,000 |
| Shaft liner - 1" | 2,420 sf | 4.15 /sf | 10,043 |
| Sound batt insulation | 137,275 sf | 1.60 /sf | 219,640 |
| Half height walls @ Auditorium | 400 sf | 22.90 /sf | 9,160 |
| LGMF framing @ locker guardrail | 4,095 sf | 5.10 /sf | 20,885 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **09.21.13 Gypsum Board Assemblies - Walls** | | | |
| GWB - 5/8", level 5 @ locker guardrail | 4,095 sf | 6.70 /sf | 27,437 |
| Curved walls - premium | 5,205 sf | 6.35 /sf | 33,074 |
| Exterior walls - 10" studs, 1/2" sheathing, 5/8" GWB, insulation | 44,220 sf | 23.50 /sf | 1,039,170 |
| Framing @ phenolic fins per A102A, A315 | 380 sf | 7.65 /sf | 2,907 |
| Install HM door frames - exterior single | 5 ea | 73.00 /ea | 365 |
| Install HM door frames - interior single | 271 ea | 73.00 /ea | 19,783 |
| Install HM door frames - exterior double | 9 ea | 117.00 /ea | 1,053 |
| Install HM door frames - interior double | 29 ea | 117.00 /ea | 3,393 |
| **Gypsum Board Assemblies - Walls** | **136,600 sf** | **26.69 /sf** | **3,645,602** |
| **09.21.16 Gypsum Board Assemblies - Ceilings & Soffits** | | | |
| Gypsum board ceilings | 21,010 sf | 15.25 /sf | 320,411 |
| Gypsum board ceilings - 1 hr | 655 sf | 19.10 /sf | 12,511 |
| Gypsum board ceilings - 2 hr | 80 sf | 22.90 /sf | 1,832 |
| Gypsum board ceilings - resilient | 5,350 sf | 31.75 /sf | 169,863 |
| Stucco soffit | 1,245 sf | 11.35 /sf | 14,131 |
| Exterior soffit framing, sheathing, insulation | 1,245 sf | 23.90 /sf | 29,756 |
| Gypsum board soffits | 28,335 sf | 25.45 /sf | 721,126 |
| Gypsum board soffits @ Learning Commons | 4,920 sf | 25.45 /sf | 125,214 |
| Gypsum board soffits @ Skylights | 1,915 sf | 25.45 /sf | 48,737 |
| **Gypsum Board Assemblies - Ceilings & Soffits** | **136,600 sf** | **10.57 /sf** | **1,443,579** |
| **09.21.25 Gypsum Board Assemblies - Patching/Infills** | | | |
| Patch GWB | 136,600 sf | 0.50 /sf | 68,300 |
| **Gypsum Board Assemblies - Patching/Infills** | **136,600 sf** | **0.50 /sf** | **68,300** |
| **09.77.33 Fiberglass Reinforced Panels** | | | |
| Fiberglass reinforced panels (FRP) - wall panels | 2,240 sf | 8.00 /sf | 17,920 |
| **Fiberglass Reinforced Panels** | **136,600 sf** | **0.13 /sf** | **17,920** |
| **09-21 DRYWALL** | **136,600 sf** | **48.08 /sf** | **6,568,069** |
| **09-30 TILE (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Tile) | (1) ls | 7,000.00 /ls | (7,000) |
| Trade support - lull, laborer for cleanup (Tile) | 1 ls | 7,000.00 /ls | 7,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **09.30.00 Tiling** | | | |
| Ceramic wall tile | 2,295 sf | 18.00 /sf | 41,310 |
| Porcelain floor tile | 5,475 sf | 25.00 /sf | 136,875 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **09.30.00 Tiling** | | | |
| Quarry floor tile | 1,770 sf | 20.00 /sf | 35,400 |
| Quarry tile base | 280 lf | 20.00 /lf | 5,600 |
| **Tiling** | **136,600 sf** | **1.61 /sf** | **219,185** |
| **09-30 TILE (TS)** | **136,600 sf** | **1.61 /sf** | **219,185** |
| **09-51 ACOUSTICAL CEILINGS (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Ceilings) | (1) ls | 49,000.00 /ls | (49,000) |
| Trade support - lull, laborer for cleanup (Ceilings) | 1 ls | 49,000.00 /ls | 49,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **09.51.00 Acoustical Ceilings** | | | |
| A1 - Armstrong Ultima #1911, random running bond pattern | 21,400 sf | 9.00 /sf | 192,600 |
| A1 - Armstrong Ultima #1911 @ Learning Commons corridors | 9,980 sf | 9.00 /sf | 89,820 |
| A2 - Armstrong Calla #2824 | 20,985 sf | 8.00 /sf | 167,880 |
| A3 - USG Geometrix 3 Dimensional | 3,815 sf | 35.00 /sf | 133,525 |
| A4 - Armstrong Healthzone Ultima | 1,760 sf | 7.00 /sf | 12,320 |
| **Acoustical Ceilings** | **136,600 sf** | **4.36 /sf** | **596,145** |
| **09.80.00 Acoustical Treatment** | | | |
| Fabric wrapped acoustical panels | 12,275 sf | 20.00 /sf | 245,500 |
| Tectum wall panels | 5,535 sf | 18.00 /sf | 99,630 |
| Mural panorama wall covering | 1,485 sf | 1.50 /sf | 2,228 |
| **Acoustical Treatment** | **136,600 sf** | **2.54 /sf** | **347,358** |
| **09-51 ACOUSTICAL CEILINGS (TS)** | **136,600 sf** | **6.91 /sf** | **943,503** |
| **09-64 WOOD FLOORING** | | | |
| **09.64.00 Wood Flooring** | | | |
| Hardwood stage assembly | 1,610 sf | 25.00 /sf | 40,250 |
| Wood athletic flooring | 8,570 sf | 20.00 /sf | 171,400 |
| **Wood Flooring** | **136,600 sf** | **1.55 /sf** | **211,650** |
| **09-64 WOOD FLOORING** | **136,600 sf** | **1.55 /sf** | **211,650** |
| **09-65 RESILIENT FLOORING (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Resilient) | (1) ls | 48,000.00 /ls | (48,000) |
| Trade support - lull, laborer for cleanup (Resilient) | 1 ls | 48,000.00 /ls | 48,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **09.61.00 Flooring Treatment** | | | |
| Underlayment at 2nd and 3rd floor linoleum - Forbo NR99, exclude corridors | 62,015 sf | 4.00 /sf | 248,060 |
| *Moisture mitigation - Excluded* | - | /- | |
| **Flooring Treatment** | **136,600 sf** | **1.82 /sf** | **248,060** |
| **09.65.00 Resilient Flooring** | | | |
| Linoleum tile | 100,135 sf | 6.00 /sf | 600,810 |
| Linoleum tile base w/trim | 19,260 lf | 9.00 /lf | 173,340 |
| Rubber base | 2,175 lf | 3.50 /lf | 7,613 |
| Vented base @ Gym | 370 lf | 8.00 /lf | 2,960 |
| Rubber flooring @ ornamental stairs | 770 sf | 8.00 /sf | 6,160 |
| **Resilient Flooring** | **136,600 sf** | **5.79 /sf** | **790,883** |
| **09-65 RESILIENT FLOORING (TS)** | **136,600 sf** | **7.61 /sf** | **1,038,943** |
| **09-67 RESINOUS FLOORING** | | | |
| **09.67.00 Fluid-Applied Flooring** | | | |
| Epoxy flooring/base | 5,780 sf | 14.00 /sf | 80,920 |
| **Fluid-Applied Flooring** | **136,600 sf** | **0.59 /sf** | **80,920** |
| **09-67 RESINOUS FLOORING** | **136,600 sf** | **0.59 /sf** | **80,920** |
| **09-68 CARPET** | | | |
| **09.68.00 Carpeting** | | | |
| Carpet @ Auditorium | 135 sy | 45.00 /sy | 6,075 |
| **Carpeting** | **136,600 sf** | **0.04 /sf** | **6,075** |
| **12.48.13 Entrance Floor Mats & Frames** | | | |
| Entry mats - recessed | 435 sf | 40.00 /sf | 17,400 |
| **Entrance Floor Mats & Frames** | **136,600 sf** | **0.13 /sf** | **17,400** |
| **09-68 CARPET** | **136,600 sf** | **0.17 /sf** | **23,475** |
| **09-90 PAINTING (TS)** | | | |
| **09.90.00 Painting & Coating** | | | |
| Paint GWB partitions | 227,710 sf | 0.80 /sf | 182,168 |
| *Paint CMU - N/A* | - | /- | |
| Epoxy wall paint | 15,550 sf | 2.30 /sf | 35,765 |
| Prep/paint Bandshell | 1 ls | 10,000.00 /ls | 10,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **09.90.00 Painting & Coating** | | | |
| Prep/paint main and West Admin egress canopies | 1 ls | 10,000.00 /ls | 10,000 |
| Paint GWB ceilings | 21,735 sf | 1.00 /sf | 21,735 |
| Paint GWB soffits | 35,170 sf | 1.00 /sf | 35,170 |
| Paint HM doors - exerior | 23 lvs | 90.00 /lvs | 2,070 |
| Paint HM doors - interior | 45 lvs | 90.00 /lvs | 4,050 |
| Paint HM frames - exterior, single | 5 ea | 50.00 /ea | 250 |
| Paint HM frames - interior, single | 271 ea | 50.00 /ea | 13,550 |
| Paint HM frames - exterior, double | 9 ea | 60.00 /ea | 540 |
| Paint HM frames - interior, double | 29 ea | 60.00 /ea | 1,740 |
| Paint egress stairs | 5 flt | 2,000.00 /flt | 10,000 |
| Paint exposed ceilings | 24,085 sf | 1.50 /sf | 36,128 |
| Paint exposed ceilings @ Gym and Auditorium | 14,385 sf | 2.50 /sf | 35,963 |
| Seal concrete floor | 7,245 sf | 2.00 /sf | 14,490 |
| Misc. exterior painting | 73,210 sf | 0.50 /sf | 36,605 |
| Touchup | 136,600 sf | 0.50 /sf | 68,300 |
| **Painting & Coating** | **136,600 sf** | **3.80 /sf** | **518,523** |
| **09-90 PAINTING (TS)** | **136,600 sf** | **3.80 /sf** | **518,523** |
| **10-14 SIGNAGE** | | | |
| **10.14.00 Signage** | | | |
| Interior signage | 136,600 sf | 0.35 /sf | 47,810 |
| *Exterior signage* | *BP#1* | */BP#1* | |
| **Signage** | **136,600 sf** | **0.35 /sf** | **47,810** |
| **10-14 SIGNAGE** | **136,600 sf** | **0.35 /sf** | **47,810** |
| **10-24 OPERABLE PARTITIONS** | | | |
| **10.22.00 Partitions** | | | |
| Operable partitions w/writeable surface on one side | 325 sf | 77.00 /sf | 25,025 |
| Operable partitions w/writeable surface on both sides | 2,740 sf | 98.00 /sf | 268,520 |
| **Partitions** | **136,600 sf** | **2.15 /sf** | **293,545** |
| **10-24 OPERABLE PARTITIONS** | **136,600 sf** | **2.15 /sf** | **293,545** |
| **10-51 LOCKERS** | | | |
| **10.51.00 Lockers** | | | |
| Student lockers - phenolic | 660 ea | 600.00 /ea | 396,000 |
| Athletic lockers | 80 ea | 350.00 /ea | 28,000 |
| Staff lockers | 12 ea | 400.00 /ea | 4,800 |
| Locker benches | 12 lf | 55.00 /lf | 660 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Lockers** | **136,600 sf** | **3.14 /sf** | **429,460** |
| **10-51 LOCKERS** | **136,600 sf** | **3.14 /sf** | **429,460** |
| **10-95 MISCELLANEOUS SPECIALTIES** | | | |
| **10.11.00 Visual Display Units** | | | |
| Magnetic writeable wall covering | 9,045 sf | 22.00 /sf | 198,990 |
| **Visual Display Units** | **136,600 sf** | **1.46 /sf** | **198,990** |
| **10.21.00 Compartments & Cubicles** | | | |
| Toilet partition | 23 ea | 1,020.00 /ea | 23,460 |
| Toilet partition - handicap | 16 ea | 1,650.00 /ea | 26,400 |
| Urinal screens - wall-hung | 15 ea | 433.00 /ea | 6,495 |
| Cubicle curtains | 45 lf | 40.00 /lf | 1,800 |
| Cubicle curtain track | 45 lf | 11.50 /lf | 518 |
| **Compartments & Cubicles** | **136,600 sf** | **0.43 /sf** | **58,673** |
| **10.26.00 Wall & Door Protection** | | | |
| Corner guards | 1 ls | 20,000.00 /ls | 20,000 |
| **Wall & Door Protection** | **136,600 sf** | **0.15 /sf** | **20,000** |
| **10.28.00 Toilet, Bath, & Laundry Accessories** | | | |
| Toilet paper dispenser | 54 ea | 105.17 /ea | 5,679 |
| Grab bar | 62 ea | 141.38 /ea | 8,765 |
| Soap dispenser - surface mounted | 59 ea | 87.64 /ea | 5,171 |
| Paper towel dispenser - recessed | 32 ea | 136.79 /ea | 4,377 |
| Framed mirrors | 15 ea | 171.00 /ea | 2,565 |
| Sanitary napkin disposal | 46 ea | 274.00 /ea | 12,604 |
| Shower curtains, hooks & rod | 3 ea | 125.00 /ea | 375 |
| Shower seat | 2 ea | 668.00 /ea | 1,336 |
| Mop rack | 3 ea | 230.67 /ea | 692 |
| **Toilet, Bath, & Laundry Accessories** | **136,600 sf** | **0.30 /sf** | **41,564** |
| **10.40.00 Safety Specialties** | | | |
| Fire extinguisher cabinet - fully recessed | 27 ea | 350.00 /ea | 9,450 |
| **Safety Specialties** | **136,600 sf** | **0.07 /sf** | **9,450** |
| **10.80.00 Other Specialties** | | | |
| Misc. specialties - Allowance | 136,600 sf | 0.25 /sf | 34,150 |
| **Other Specialties** | **136,600 sf** | **0.25 /sf** | **34,150** |
| **11.52.00 Audio-Visual Equipment** | | | |
| Projection screen @ Gym, Cafeteria | 2 ea | 10,000.00 /ea | 20,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **11.52.00 Audio-Visual Equipment** | | | |
| Projection screen | 1 ea | 5,000.00 /ea | 5,000 |
| **Audio-Visual Equipment** | **136,600 sf** | **0.18 /sf** | **25,000** |
| **10-95 MISCELLANEOUS SPECIALTIES** | **136,600 sf** | **2.84 /sf** | **387,827** |
| **11-31 RESIDENTIAL APPLIANCES** | | | |
| **11.31.00 Residential Appliances** | | | |
| Misc. appliances | 1 ls | 10,000.00 /ls | 10,000 |
| Refrigerator | 7 ea | 1,200.00 /ea | 8,400 |
| *Ice maker - None shown* | - | /- | |
| *Undercounter refrigerator - None shown* | - | /- | |
| Microwave oven | 1 ea | 450.00 /ea | 450 |
| Range hood | 1 ea | 650.00 /ea | 650 |
| Range | 1 ea | 900.00 /ea | 900 |
| Dishwasher | 4 ea | 925.00 /ea | 3,700 |
| Washer/dryer - stackable | 2 ea | 1,500.00 /ea | 3,000 |
| **Residential Appliances** | **136,600 sf** | **0.20 /sf** | **27,100** |
| **11-31 RESIDENTIAL APPLIANCES** | **136,600 sf** | **0.20 /sf** | **27,100** |
| **11-40 FOOD SERVICE EQUIPMENT** | | | |
| **11.40.00 Foodservice Equipment** | | | |
| Food service equipment - Allowance | 1 ls | 415,270.00 /ls | 415,270 |
| **Foodservice Equipment** | **136,600 sf** | **3.04 /sf** | **415,270** |
| **11-40 FOOD SERVICE EQUIPMENT** | **136,600 sf** | **3.04 /sf** | **415,270** |
| **11-51 AUDIO-VISUAL EQUIPMENT** | | | |
| **11.52.00 Audio-Visual Equipment** | | | |
| Sound systems @ Auditorium - Allowance | 1 allw | 200,000.00 /allw | 200,000 |
| Sound systems @ Gym - Allowance | 1 allw | 120,000.00 /allw | 120,000 |
| Sound systems @ Cafeteria - Allowance | 1 allw | 50,000.00 /allw | 50,000 |
| Sound systems @ Band/Chorus - Allowance | 2 allw | 30,000.00 /allw | 60,000 |
| Sound systems @ Drama - Allowance | 1 allw | 20,000.00 /allw | 20,000 |
| **Audio-Visual Equipment** | **136,600 sf** | **3.29 /sf** | **450,000** |
| **11-51 AUDIO-VISUAL EQUIPMENT** | **136,600 sf** | **3.29 /sf** | **450,000** |
| **11-61 THEATER & STAGE EQUIPMENT** | | | |
| **11.61.00 Theater & Stage Equipment** | | | |
| *Orchestra enclosures - FFE* | - | /- | |
| Theatrical rigging - Allowance | 1 ls | 158,300.00 /ls | 158,300 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **11.61.00 Theater & Stage Equipment** | | | |
| Theatrical draperies - Allowance | 1 ls | 33,854.00 /ls | 33,854 |
| Theatrical lighting instruments & accessories - Allowance | 1 ls | 129,018.00 /ls | 129,018 |
| Theatrical lighting controls - Allowance | 1 ls | 95,749.00 /ls | 95,749 |
| **Theater & Stage Equipment** | **136,600 sf** | **3.05 /sf** | **416,921** |
| **11-61 THEATER & STAGE EQUIPMENT** | **136,600 sf** | **3.05 /sf** | **416,921** |
| **11-65 ATHLETIC/RECREATIONAL EQUIPMENT** | | | |
| **11.65.00 Athletic & Recreational Equipment** | | | |
| Basketball backstop - ceiling-hung | 6 ea | 6,500.00 /ea | 39,000 |
| Gym divider curtain - electric roll up | 1,530 sf | 20.00 /sf | 30,600 |
| Athletic wall padding | 835 sf | 12.50 /sf | 10,438 |
| Vollyball system | 1 ls | 5,000.00 /ls | 5,000 |
| Scoreboards - basketball | 1 ea | 7,500.00 /ea | 7,500 |
| **Athletic & Recreational Equipment** | **136,600 sf** | **0.68 /sf** | **92,538** |
| **11-65 ATHLETIC/RECREATIONAL EQUIPMENT** | **136,600 sf** | **0.68 /sf** | **92,538** |
| **11-95 VOCATIONAL SHOP EQUIPMENT** | | | |
| **11.51.00 Vocational Shop Equipment** | | | |
| Vocational shop equipment | 1 ls | 25,000.00 /ls | 25,000 |
| *- Welding booths - In Above* | - | /- | |
| *- Portable welding fumes extractor - In Above* | - | /- | |
| *- Paint spray hoods - In Above* | - | /- | |
| *- Portable wood working equipment dust collector - In HVAC* | - | /- | |
| Kiln | 1 ls | 12,000.00 /ls | 12,000 |
| **Vocational Shop Equipment** | **136,600 sf** | **0.27 /sf** | **37,000** |
| **11-95 VOCATIONAL SHOP EQUIPMENT** | **136,600 sf** | **0.27 /sf** | **37,000** |
| **12-20 WINDOW TREATMENTS** | | | |
| **12.20.00 Window Treatments** | | | |
| Roller shades | 11,205 sf | 10.00 /sf | 112,050 |
| Roller shades - interior | 3,300 sf | 10.00 /sf | 33,000 |
| Roller shades - doors | 50 ea | 150.00 /ea | 7,500 |
| **Window Treatments** | **136,600 sf** | **1.12 /sf** | **152,550** |
| **12-20 WINDOW TREATMENTS** | **136,600 sf** | **1.12 /sf** | **152,550** |
| **12-35 LAB CASEWORK** | | | |
| **11.53.00 Laboratory Equipment** | | | |
| Misc. lab equipment - Allowance | 1 ls | 25,000.00 /ls | 25,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **11.53.00 Laboratory Equipment** | | | |
| Fume hoods | 3 ea | 11,000.00 /ea | 33,000 |
| **Laboratory Equipment** | **136,600 sf** | **0.43 /sf** | **58,000** |
| **12.35.53 Laboratory Casework** | | | |
| Base cabinet w/epoxy top | 30 lf | 600.00 /lf | 18,000 |
| Epoxy countertop - open below | 325 lf | 375.00 /lf | 121,875 |
| Epoxy backsplash | 635 lf | 60.00 /lf | 38,100 |
| Wall cabinets | 105 lf | 400.00 /lf | 42,000 |
| **Laboratory Casework** | **136,600 sf** | **1.61 /sf** | **219,975** |
| **12-35 LAB CASEWORK** | **136,600 sf** | **2.04 /sf** | **277,975** |
| **12-60 FIXED AUDITORIUM SEATING** | | | |
| **12.60.00 Multiple Seating** | | | |
| Fixed audience seating | 406 ea | 285.00 /ea | 115,710 |
| **Multiple Seating** | **136,600 sf** | **0.85 /sf** | **115,710** |
| **12-60 FIXED AUDITORIUM SEATING** | **136,600 sf** | **0.85 /sf** | **115,710** |
| **12-62 BLEACHERS** | | | |
| **12.60.00 Multiple Seating** | | | |
| Retractable Bleachers at Gym | 650 seat | 155.00 /seat | 100,750 |
| **Multiple Seating** | **136,600 sf** | **0.74 /sf** | **100,750** |
| **12-62 BLEACHERS** | **136,600 sf** | **0.74 /sf** | **100,750** |
| **14-20 ELEVATORS (TS)** | | | |
| **14.20.00 Elevators** | | | |
| Passenger elevators - cab, equipment | 1 ls | 40,000.00 /ls | 40,000 |
| Passenger elevators - stops | 4 stop | 45,000.00 /stop | 180,000 |
| **Elevators** | **136,600 sf** | **1.61 /sf** | **220,000** |
| **14-20 ELEVATORS (TS)** | **136,600 sf** | **1.61 /sf** | **220,000** |
| **21-01 FIRE PROTECTION (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Fire Protection) | (1) ls | 31,000.00 /ls | (31,000) |
| Trade support - lull, laborer for cleanup (Fire Protection) | 1 ls | 31,000.00 /ls | 31,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **21.01.00 Fire Suppression General Requirements** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **21.01.00 Fire Suppression General Requirements** | | | |
| General requirements (management/design, permits, as-builts, coring, fire stopping) | 136,600 sf | 0.80 /sf | 109,280 |
| Hydraulic calculation & shop drawings | 1 ls | 8,000.00 /ls | 8,000 |
| 3D/BIM coordination | 1 ls | 10,000.00 /ls | 10,000 |
| **Fire Suppression General Requirements** | **136,600 sf** | **0.93 /sf** | **127,280** |
| **21.11.00 Fire Suppression - Water-Service Piping** | | | |
| Fire dept. inlet connection - 2-1/2" polished brass - 3 -way | 1 ea | 1,863.93 /ea | 1,864 |
| **Fire Suppression - Water-Service Piping** | **136,600 sf** | **0.01 /sf** | **1,864** |
| **21.12.00 Fire-Suppression Standpipes** | | | |
| Standpipe - sch 40 black steel piping w/ fittings - 6" | 125 lf | 99.13 /lf | 12,391 |
| Drain riser - sch 40 black steel piping w/ fittings - 3" | 125 lf | 49.66 /lf | 6,208 |
| Fire hose valve - 2-1/2" | 12 ea | 353.36 /ea | 4,240 |
| Fire valve cabinet - steel - recessed | 12 ea | 894.50 /ea | 10,734 |
| **Fire-Suppression Standpipes** | **136,600 sf** | **0.25 /sf** | **33,573** |
| **21.13.13 Fire Suppression Wet-Pipe Sprinkler System** | | | |
| Sprinkler head - wet - recessed pendant | 903 ea | 125.42 /ea | 113,250 |
| Sprinkler head - wet - pendant or upright | 522 ea | 77.23 /ea | 40,313 |
| Sprinkler head - wet - sidewall | 151 ea | 87.51 /ea | 13,213 |
| Sprinkler head - wet - window | 34 ea | 87.51 /ea | 2,975 |
| Sprinkler head - extended coverage pendant or upright | 120 ea | 127.23 /ea | 15,267 |
| Sprinkler head - dry - sidewall (wet system) | 22 ea | 293.06 /ea | 6,447 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 1" | 3,465 lf | 23.99 /lf | 83,116 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 1-1/4" | 600 lf | 27.93 /lf | 16,757 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 1-1/2" | 5,200 lf | 30.66 /lf | 159,417 |
| Sprinkler branch piping black steel sch. 40 w/ fittings 2" | 650 lf | 34.57 /lf | 22,468 |
| Sprinkler main piping black steel sch. 40 w/ fittings (avg. size) | 1,000 lf | 62.18 /lf | 62,184 |
| Sprinkler main piping black steel sch. 10 w/ fittings 3" | 450 lf | 36.32 /lf | 16,345 |
| Sprinkler main piping black steel sch. 10 w/ fittings 4" | 3,180 lf | 39.66 /lf | 126,127 |
| Sprinkler main piping black steel sch. 10 w/ fittings 6" | 500 lf | 69.39 /lf | 34,695 |
| Wet alarm valve - 6" | 1 ea | 3,656.71 /ea | 3,657 |
| Double check valve (BFP) assembly - 6" | 1 ea | 8,244.56 /ea | 8,245 |
| Butterfly valve - 6" | 2 ea | 1,566.71 /ea | 3,133 |
| Zone flow control valve - 4" | 7 ea | 2,521.71 /ea | 17,652 |
| Waterflow switch | 8 ea | 421.96 /ea | 3,376 |
| Tamper switch | 8 ea | 356.96 /ea | 2,856 |
| Water motor gong bell | 1 ea | 628.36 /ea | 628 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Fire Suppression Wet-Pipe Sprinkler System** | **136,600 sf** | **5.51 /sf** | **752,122** |
| **21-01 FIRE PROTECTION (TS)** | **136,600 sf** | **6.70 /sf** | **914,839** |
| **22-01 PLUMBING (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Plumbing) | (1) ls | 83,000.00 /ls | (83,000) |
| Trade support - lull, laborer for cleanup (Plumbing) | 1 ls | 83,000.00 /ls | 83,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **22.00.05 PLUMBING - General Requirements** | | | |
| General requirements (management, permits, as-builts, coring, fire stopping) | 136,600 sf | 0.75 /sf | 102,450 |
| 3D/BIM coordination | 1 ls | 12,000.00 /ls | 12,000 |
| Core drilling | 1 ls | 10,000.00 /ls | 10,000 |
| Project management | 1 ls | 50,000.00 /ls | 50,000 |
| Kitchen Equipment Tie ins | 1 ls | 12,000.00 /ls | 12,000 |
| **PLUMBING - General Requirements** | **136,600 sf** | **1.37 /sf** | **186,450** |
| **22.07.00 PLUMBING - Insulation** | | | |
| Insulation/copper pipe/fiberglass | 7,975 lf | 8.44 /lf | 67,307 |
| Insulation/rainleader pipe/fiberglass/PVC jacketed/horiz. & vert. | 1,200 lf | 40.61 /lf | 48,737 |
| **PLUMBING - Insulation** | **136,600 sf** | **0.85 /sf** | **116,044** |
| **22.08.00 Plumbing Commissioning Support** | | | |
| Commissioning support/day | 5 day | 824.56 /day | 4,123 |
| **Plumbing Commissioning Support** | **136,600 sf** | **0.03 /sf** | **4,123** |
| **22.10.00 Plumbing Facility Water Distribution** | | | |
| Water meter w/remote readout - 4" | 1 ea | 2,285.75 /ea | 2,286 |
| Water sub-meter - avg. size | 1 ea | 1,561.84 /ea | 1,562 |
| Water sub-meter - 1.5 Circ | 1 ea | 1,261.84 /ea | 1,262 |
| Water sub-meter - 2" Domestic WH | 1 ea | 1,277.30 /ea | 1,277 |
| Backflow preventer/RPZ-BFP - dishwasher | 1 ea | 1,809.21 /ea | 1,809 |
| Backflow preventer/RPZ-BFP - 2" LW | 2 ea | 1,657.68 /ea | 3,315 |
| Backflow preventer/RPZ-BFP - 4" | 1 ea | 1,960.75 /ea | 1,961 |
| Pressure reducing valve/PRV - 1" | 1 ea | 1,159.21 /ea | 1,159 |
| Pressure reducing valve - 4" | 1 ea | 2,210.75 /ea | 2,211 |
| Recirculation pump/bronze/6.5 gpm - 1/8 hp (B&G Ecocirc) | 1 ea | 1,806.14 /ea | 1,806 |
| Recirculation pump/bronze/10 gpm - 1/6 hp (B&G #SSF-22) | 2 ea | 709.14 /ea | 1,418 |
| Expansion tank/ASME/potable - 9 gal (B&G #PTA-30V) | 1 ea | 1,250.61 /ea | 1,251 |
| TMV/master/hi-lo temp. | 1 ea | 2,759.21 /ea | 2,759 |
| Hose bibbs w/vac. breaker/encased - interior | 19 ea | 382.50 /ea | 7,268 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **22.10.00 Plumbing Facility Water Distribution** | | | |
| Hose bibbs/exterior/encased (Zurn #Z1320) | 3 ea | 452.07 /ea | 1,356 |
| Trap primers/electronic - 8 outlet (PPP #PT-8) | 8 ea | 1,359.91 /ea | 10,879 |
| Shock absorbers/12 - 33 fixture units (Shoktrol #200) | 3 ea | 269.77 /ea | 809 |
| Valve box/washing machine | 1 ea | 226.54 /ea | 227 |
| Valve box/ice machine | 3 ea | 176.54 /ea | 530 |
| Domestic water entrance UG/ductile iron - 4" | 20 lf | 306.14 /lf | 6,123 |
| Domestic water AG/type "L" copper/press fit ftgs. - avg. size | 525 lf | 23.31 /lf | 12,235 |
| Domestic water AG/type "L" copper/press fit - 1/2" TP | 1,120 lf | 13.02 /lf | 14,577 |
| Domestic water AG/type "L" copper/press fit - 1/2" NP | 800 lf | 13.02 /lf | 10,412 |
| Domestic water AG/type "L" copper/press fit - 1/2" | 1,460 lf | 13.02 /lf | 19,002 |
| Domestic water AG/type "L" copper/press fit - 3/4" NP | 450 lf | 15.76 /lf | 7,091 |
| Domestic water AG/type "L" copper/press fit - 3/4" | 1,240 lf | 15.76 /lf | 19,539 |
| Domestic water AG/type "L" copper/press fit - 1" NP | 100 lf | 20.56 /lf | 2,056 |
| Domestic water AG/type "L" copper/press fit - 1" | 50 lf | 20.57 /lf | 1,028 |
| Domestic water AG/type "L" copper/press fit - 1-1/4" NP | 100 lf | 25.23 /lf | 2,523 |
| Domestic water AG/type "L" copper/press fit - 1-1/4" | 115 lf | 25.23 /lf | 2,902 |
| Domestic water AG/type "L" copper/press fit - 1-1/2" | 400 lf | 30.31 /lf | 12,125 |
| Domestic water AG/type "L" copper/press fit - 2" NP | 450 lf | 41.16 /lf | 18,523 |
| Domestic water AG/type "L" copper/press fit - 2" | 300 lf | 41.16 /lf | 12,349 |
| Domestic water AG/type "L" copper/press fit - 2-1/2" | 285 lf | 66.38 /lf | 18,919 |
| Domestic water AG/type "L" copper/press fit - 3" | 480 lf | 84.91 /lf | 40,759 |
| Domestic water AG/type "L" copper/press fit - 4" | 100 lf | 116.00 /lf | 11,600 |
| Non-potable water AG/type "L" copper/solder - Hood Tie In | 60 lf | 22.94 /lf | 1,377 |
| - Domestic water piping accessories DOM | 6,095 lf | 2.78 /lf | 16,917 |
| - Domestic water piping accessories NP | 1,900 lf | 2.78 /lf | 5,274 |
| - Domestic water heat tracing/small bore piping All LHW | 1,900 lf | 25.97 /lf | 49,340 |
| - Domestic water pipe & equipment I.D. DOM | 6,095 lf | 1.61 /lf | 9,817 |
| - Domestic water pipe & equipment I.D. NP | 1,900 lf | 1.52 /lf | 2,881 |
| - Domestic water pressure gauges & thermometers | 12 ea | 120.61 /ea | 1,447 |
| - Domestic water support steel/additional to hangers & clamps | 1 ls | 1,074.56 /ls | 1,075 |
| - Layout Mech Room | 1 ls | 20,000.00 /ls | 20,000 |
| - Domestic water storage tank | 1 ls | 3.52 /ls | 4 |
| **Plumbing Facility Water Distribution** | **136,600 sf** | **2.67 /sf** | **365,038** |
| **22.13.00 PLUMBING - Sanitary, Waste & Vent Piping** | | | |
| Floor drain - 3" (#ZN415-6B) | 16 ea | 294.07 /ea | 4,705 |
| Floor drain - 4" (#ZN415-8B) | 4 ea | 353.07 /ea | 1,412 |
| Floor sink/12x12 - 4" (#Z1900) | 8 ea | 2,581.14 /ea | 20,649 |
| Floor cleanouts - 4" (#ZN1400) | 37 ea | 291.07 /ea | 10,770 |
| Wall cleanouts - 4" (#Z1468) | 10 ea | 101.08 /ea | 1,011 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **22.13.00 PLUMBING - Sanitary, Waste & Vent Piping** | | | |
| Grease interceptor/interior/size 800/75 gpm/150 gal. | 2 ea | 4,291.56 /ea | 8,583 |
| 8000 Gallon Concrete Grease Trap | 1 ea | 17,649.12 /ea | 17,649 |
| Elevator sump pump/oil minder | 1 ea | 3,812.28 /ea | 3,812 |
| Grease interceptor flow control | 1 ea | 417.14 /ea | 417 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 2" | 220 lf | 31.98 /lf | 7,036 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 3" | 236 lf | 36.45 /lf | 8,602 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 4" | 610 lf | 44.78 /lf | 27,315 |
| Sanitary UG/cast iron single hub pipe & ftgs. - 6" | 275 lf | 74.82 /lf | 20,576 |
| Sanitary AG/cast iron no hub pipe & ftgs. - avg. size Fixture Runouts | 1,560 lf | 47.33 /lf | 73,828 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 1-1/2" | 30 lf | 33.82 /lf | 1,015 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 2" | 750 lf | 34.83 /lf | 26,119 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 3" | 980 lf | 44.36 /lf | 43,468 |
| Sanitary AG/cast iron no hub pipe & ftgs. - 4" | 495 lf | 52.52 /lf | 25,999 |
| Grease waste UG/cast iron single hub pipe & ftgs. - 2" | 40 lf | 31.98 /lf | 1,279 |
| Grease waste UG/cast iron single hub pipe & ftgs. - 3" | 20 lf | 36.45 /lf | 729 |
| Grease waste UG/cast iron single hub pipe & ftgs. - 4" | 220 lf | 44.78 /lf | 9,851 |
| Grease waste AG/cast iron no hub pipe & ftgs. - 2" | 55 lf | 34.83 /lf | 1,915 |
| Grease waste AG/cast iron no hub pipe & ftgs. - 3" | 65 lf | 44.36 /lf | 2,883 |
| Grease waste AG/cast iron no hub pipe & ftgs. - 4" | 70 lf | 52.52 /lf | 3,677 |
| - Sanitary waste & vent piping accessories | 5,626 lf | 1.77 /lf | 9,976 |
| - Sanitary piping & equipment I.D. | 5,626 lf | 1.81 /lf | 10,171 |
| **PLUMBING - Sanitary, Waste & Vent Piping** | **136,600 sf** | **2.51 /sf** | **343,448** |
| **22.14.00 PLUMBING - Rainleader Piping** | | | |
| Roof drain/#ZC100 - 4" | 9 ea | 298.07 /ea | 2,683 |
| Roof drain/#ZC100 - 5" | 2 ea | 387.84 /ea | 776 |
| Roof drain/#ZC100 - 6" | 14 ea | 387.84 /ea | 5,430 |
| Floor cleanouts - 4" (#ZN1400) | 6 ea | 291.07 /ea | 1,746 |
| Wall cleanouts - 4" (#Z1468) | 12 ea | 101.07 /ea | 1,213 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 4" | 90 lf | 44.77 /lf | 4,030 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 6" | 90 lf | 74.82 /lf | 6,734 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 8" | 70 lf | 103.25 /lf | 7,228 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 10" | 160 lf | 141.04 /lf | 22,566 |
| Rainleader UG/cast iron single hub pipe & ftgs. - 12" | 25 lf | 186.99 /lf | 4,675 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 4" | 265 lf | 52.53 /lf | 13,919 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 6" | 410 lf | 81.16 /lf | 33,274 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 8" | 460 lf | 133.84 /lf | 61,565 |
| Rainleader AG/cast iron no hub pipe & ftgs. - 10" | 10 lf | 198.47 /lf | 1,985 |
| - Rainleader piping accessories | 1,580 lf | 1.77 /lf | 2,802 |
| - Rainleader piping & equipment I.D. | 1,580 lf | 1.46 /lf | 2,314 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **PLUMBING - Rainleader Piping** | **136,600 sf** | **1.27 /sf** | **172,939** |
| **22.20.00 Plumbing Facility Gas Piping - Natural & LP Gas** | | | |
| Gas Flow Meter - avg. size | 1 ea | 1,857.68 /ea | 1,858 |
| Emergency gas shut off/cabinet w/1" solonoid & UL ball valve 1114, 1111A | 2 ea | 3,968.42 /ea | 7,937 |
| Emergency gas shut off/cabinet w/1-1/2" solonoid & UL ball valve KIT | 1 ea | 5,093.42 /ea | 5,093 |
| - Remote panic buttons | 2 ea | 828.07 /ea | 1,656 |
| Gas turret/single | 5 ea | 212.07 /ea | 1,060 |
| Gas turret/double | 5 ea | 320.54 /ea | 1,603 |
| Gas piping/sch 40 black steel CW t&c - 1" | 240 lf | 28.68 /lf | 6,882 |
| Gas piping/sch 40 black steel CW t&c - 1-1/4" | 120 lf | 34.14 /lf | 4,097 |
| Gas piping/sch 40 black steel CW t&c - 1-1/2" | 65 lf | 37.25 /lf | 2,421 |
| Gas piping/sch 40 black steel CW t&c - 2" | 10 lf | 42.28 /lf | 423 |
| Gas piping/sch 40 blk stl ERW weld - 2-1/2" | 30 lf | 45.73 /lf | 1,372 |
| Gas piping/sch 40 blk stl ERW weld - 3" | 75 lf | 54.12 /lf | 4,059 |
| Gas piping/sch 40 blk stl ERW weld - 4" | 60 lf | 87.71 /lf | 5,263 |
| Gas piping/sch 40 blk stl ERW weld - 8" | 25 lf | 180.43 /lf | 4,511 |
| - Gas piping accessories | 625 lf | 2.52 /lf | 1,577 |
| - Gas piping link seals | 1 ea | 404.61 /ea | 405 |
| - Gas piping & equipment I.D. | 625 lf | 28.95 /lf | 18,094 |
| **Plumbing Facility Gas Piping - Natural & LP Gas** | **136,600 sf** | **0.50 /sf** | **68,310** |
| **22.30.00 PLUMBING - Equipment** | | | |
| Domestic Boilers/gas fired/399 mbh (AO Smith #BTH-300A) | 2 ea | 15,618.42 /ea | 31,237 |
| Boiler Flues | 1 ls | 45,525.00 /ls | 45,525 |
| Water Heater Flues | 1 ls | 24,000.00 /ls | 24,000 |
| HWH/indirect fed - 300 gal | 1 ea | 7,418.42 /ea | 7,418 |
| **PLUMBING - Equipment** | **136,600 sf** | **0.79 /sf** | **108,180** |
| **22.40.00 PLUMBING - Fixtures** | | | |
| Water closet/wall mnt./carrier/flush valve | 22 ea | 1,330.12 /ea | 29,263 |
| Water closet/wall mnt./carrier/flush valve/ADA | 32 ea | 1,367.52 /ea | 43,761 |
| Urinal/wall mnt./carrier/flush valve | 18 ea | 1,202.85 /ea | 21,651 |
| Urinal/wall mnt./carrier/flush valve/ADA | 5 ea | 1,241.35 /ea | 6,207 |
| Lavatory/undermount/std 1-lever faucet | 54 ea | 523.24 /ea | 28,255 |
| Lavatory/undermount/std 1-lever faucet/ADA | 10 ea | 586.41 /ea | 5,864 |
| Lavatory/wall hung/std 1-lever faucet/carrier/ADA | 15 ea | 1,147.55 /ea | 17,213 |
| Mixing valve/single lav. (Leonard #170) | 85 ea | 348.84 /ea | 29,651 |
| P15 Sink/lay-in/1-bowl 20"x22"/std faucet/ADA | 2 ea | 1,560.75 /ea | 3,121 |
| P14 Sink/lay-in/1-bowl 20"x22"/std faucet/ADA Maker Space | 2 ea | 1,610.75 /ea | 3,221 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **22.40.00 PLUMBING - Fixtures** | | | |
| P7 Sink/lay-in/1-bowl 21"x15"/std faucet | 36 ea | 1,584.98 /ea | 57,059 |
| P9 Sink/lay-in/1-bowl 21"x15"/std faucet Art Room | 3 ea | 1,384.98 /ea | 4,155 |
| P9A Sink/lay-in/1-bowl 21"x15"/std faucet/ADA Art Room | 1 ea | 1,455.75 /ea | 1,456 |
| P7A Sink/lay-in/1-bowl 21"x15"/std faucet/ADA | 3 ea | 1,860.75 /ea | 5,582 |
| P8 Sinlk/lay-in/1-bowl/22"x16"/bubbler | 5 ea | 1,715.35 /ea | 8,577 |
| P-13 Sink/acid waste/undermount/std 2-lever faucet/ss - 21"x15"x10"D | 3 ea | 1,508.82 /ea | 4,526 |
| - Solids interceptors (Art Room sinks) | 4 ea | 552.64 /ea | 2,211 |
| Mop sink/floor mnt - 24"x24" | 5 ea | 1,349.01 /ea | 6,745 |
| P6 Shower stall/std valve & access./3'x3' fiberglass | 1 ea | 2,704.96 /ea | 2,705 |
| P6-A Shower stall/std valve & access./5'x3' fiberglass/ADA | 2 ea | 3,701.67 /ea | 7,403 |
| P13 Emergency eye wash station/mixing valve/sink mount | 3 ea | 1,106.71 /ea | 3,320 |
| Emergency shower/eye wash sta./mixing valve/cabinet mount | 7 ea | 3,540.35 /ea | 24,782 |
| Water cooler/bi-level/ADA | 10 ea | 4,418.42 /ea | 44,184 |
| - Plumbing fixtures offload & distribution | 239 ea | 103.07 /ea | 24,634 |
| - Plumbing fixtures rough-in | 239 ea | 128.07 /ea | 30,609 |
| **PLUMBING - Fixtures** | **136,600 sf** | **3.05 /sf** | **416,156** |
| **22.66.00 Plumbing Acid Neutrilization System** | | | |
| Acid neut. Tank/5 gallon - 1-sink (Orion style 5) | 1 ea | 622.14 /ea | 622 |
| Acid neut. tank/15 gallon - 3-sinks (Orion style 5) | 3 ea | 911.21 /ea | 2,734 |
| Acid neut. tank/55 gallon - | 2 ea | 1,912.28 /ea | 3,825 |
| - Limestone chips/50 lb. bag | 24 ea | 43.77 /ea | 1,050 |
| PH Monitoring (2) locations | 2 ea | 6,612.28 /ea | 13,225 |
| Floor drain - 6" (#ZN415-AA-8B) | 3 ea | 480.84 /ea | 1,443 |
| Floor cleanout/heavy duty - 4" (#ZN1400-K-AR) | 5 ea | 424.84 /ea | 2,124 |
| Wall cleanouts/#Z1468 - 4" | 5 ea | 101.07 /ea | 505 |
| Acid waste UG/sch 40 polypropylene fuseal & ftgs. - 3" | 20 lf | 58.29 /lf | 1,166 |
| Acid waste UG/sch 40 polypropylene fuseal & ftgs. - 4" | 230 lf | 68.91 /lf | 15,849 |
| Tie-ins to Lab Hoods acid waste & vent - A/G | 3 ea | 815.35 /ea | 2,446 |
| Acid waste AG/sch 40 polypropylene fuseal & ftgs. - 2" | 800 lf | 51.44 /lf | 41,154 |
| Acid waste AG/sch 40 polypropylene fuseal & ftgs. - 3" | 400 lf | 65.67 /lf | 26,269 |
| Acid waste AG/sch 40 polypropylene fuseal & ftgs. - 4" | 360 lf | 77.44 /lf | 27,877 |
| - Acid waste & vent piping accessories | 1,790 lf | 2.02 /lf | 3,622 |
| - Acid waste piping & equipment I.D. | 1,790 lf | 2.56 /lf | 4,585 |
| **Plumbing Acid Neutrilization System** | **136,600 sf** | **1.09 /sf** | **148,495** |
| **22.90.00 Plumbing - Other** | | | |
| Wiring PH Monitor and Misc Control | 1 ls | 6,000.00 /ls | 6,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Plumbing - Other** | **136,600 sf** | **0.04 /sf** | **6,000** |
| **22-01 PLUMBING (TS)** | **136,600 sf** | **14.17 /sf** | **1,935,182** |
| **23-01 HVAC (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (HVAC) | (1) ls | 343,000.00 /ls | (343,000) |
| Trade support - lull, laborer for cleanup (HVAC) | 1 ls | 343,000.00 /ls | 343,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **23.00.05 HVAC - General Requirements** | | | |
| General requirements (sq. ft.) | 136,600 sf | 1.15 /sf | 157,090 |
| 3D/BIM coordination | 1 ls | 100,000.00 /ls | 100,000 |
| **HVAC - General Requirements** | **136,600 sf** | **1.88 /sf** | **257,090** |
| **23.05.93 HVAC Testing Adjusting & Balancing (TAB)** | | | |
| Testing & balancing/cost per sq. ft. | 136,600 sf | 0.65 /sf | 88,790 |
| **HVAC Testing Adjusting & Balancing (TAB)** | **136,600 sf** | **0.65 /sf** | **88,790** |
| **23.07.00 HVAC - Insulation** | | | |
| Insulation/ductwork/blanket wrap | 83,500 sf | 3.55 /sf | 296,088 |
| Insulation/ductwork/weatherproof exposed | 4,500 sf | 12.89 /sf | 57,986 |
| Insulation/pipe/copper | 14,483 lf | 7.09 /lf | 102,715 |
| Insulation/pipe/weld | 3,838 lf | 12.50 /lf | 47,975 |
| **HVAC - Insulation** | **136,600 sf** | **3.70 /sf** | **504,764** |
| **23.08.00 HVAC - Commissioning Support** | | | |
| Commissioning support/lump sum | 1 ls | 15,000.00 /ls | 15,000 |
| **HVAC - Commissioning Support** | **136,600 sf** | **0.11 /sf** | **15,000** |
| **23.09.00 HVAC - Automatic Temperature Controls** | | | |
| Automatic temperature controls/cost per sq. ft. | 136,600 sf | 0.25 /sf | 34,150 |
| ATC - Air valve/hood exhaust/HEX | 3 ea | 4,194.32 /ea | 12,583 |
| ATC - Air valves/no coil control wiring - 3 pts./fume hood | 9 pnt | 437.00 /pnt | 3,933 |
| ATC - RTU's/custom - 30 pts. | 240 pnt | 1,303.18 /pnt | 312,763 |
| ATC - MUA units - 10 pts. | 10 pnt | 759.44 /pnt | 7,594 |
| ATC - Exhaust fans - 3 pts. | 18 pnt | 711.10 /pnt | 12,800 |
| ATC - Life safty fans - 8 pts. | 32 pnt | 766.15 /pnt | 24,517 |
| ATC - Lab exhaust fans - 5 pts./fan | 25 pnt | 766.15 /pnt | 19,154 |
| ATC - Boilers/modular - 10 pts. | 20 pnt | 821.19 /pnt | 16,424 |
| ATC - Pumps - 4 pts. | 16 pnt | 766.15 /pnt | 12,258 |
| ATC - VFD wiring for pumps (remote mount) - 4 pts. | 16 pnt | 763.91 /pnt | 12,223 |
| ATC - Circulators - 2 pts. | 4 pnt | 488.68 /pnt | 1,955 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **23.09.00 HVAC - Automatic Temperature Controls** | | | |
| ATC - Chillers - 15 pts. | 15 pnt | 1,303.18 /pnt | 19,548 |
| ATC - VAV box/no coil (ATC furn./factory install controls) 2 pts. | 310 pnt | 408.36 /pnt | 126,592 |
| ATC - Fintube radiation zones - 2 pts. | 20 pnt | 381.96 /pnt | 7,639 |
| ATC - electric fintube radiation zones - 2 pts. | 4 pnt | 381.95 /pnt | 1,528 |
| ATC - Cabinet unit heaters - 3 pts. | 42 pnt | 381.96 /pnt | 16,042 |
| ATC - Unit heaters - 3 pts. | 6 pnt | 381.95 /pnt | 2,292 |
| ATC - Radiant ceiling panel zones - 2 pts. | 246 pnt | 381.96 /pnt | 93,961 |
| ATC - Plumbing points - 10 pts. | 10 pnt | 595.50 /pnt | 5,955 |
| ATC - Elctrical points - 10 pts. | 10 pnt | 595.50 /pnt | 5,955 |
| **HVAC - Automatic Temperature Controls** | **136,600 sf** | **5.49 /sf** | **749,864** |
| **23.21.13 Hydronic Piping** | | | |
| Hot water s&r/type "L" copper solder - 3/4" | 8,970 lf | 20.16 /lf | 180,835 |
| Hot water s&r/type "L" copper solder - 1" | 1,760 lf | 25.01 /lf | 44,018 |
| Hot water s&r/type "L" copper solder - 1-1/4" | 1,260 lf | 28.57 /lf | 35,998 |
| Hot water s&r/type "L" copper solder - 1-1/2" | 890 lf | 32.82 /lf | 29,210 |
| Hot water s&r/type "L" copper solder - 2" | 1,550 lf | 41.25 /lf | 63,937 |
| Hot water s&r/sch 40 blk stl ERW weld - 2-1/2" | 605 lf | 50.55 /lf | 30,583 |
| Hot water s&r/sch 40 blk stl ERW weld - 3" | 475 lf | 59.42 /lf | 28,225 |
| Hot water s&r/sch 40 blk stl ERW weld - 4" | 756 lf | 82.30 /lf | 62,219 |
| Hot water s&r/sch 40 blk stl ERW weld - 6" | 520 lf | 134.07 /lf | 69,716 |
| Hot water s&r/sch 40 blk stl ERW weld - 8" | 220 lf | 167.74 /lf | 36,903 |
| Glycol water s&r/type "L" copper solder - 2" | 53 lf | 41.25 /lf | 2,186 |
| Glycol water s&r/sch 40 blk stl ERW weld - 2-1/2" | 47 lf | 50.55 /lf | 2,376 |
| Glycol water s&r/sch 40 blk stl ERW weld - 3" | 90 lf | 59.42 /lf | 5,348 |
| Glycol water s&r/sch 40 blk stl ERW weld - 4" | 152 lf | 82.30 /lf | 12,510 |
| Glycol water s&r/sch 40 blk stl ERW weld - 6" | 910 lf | 134.07 /lf | 122,004 |
| Glycol water s&r/sch 40 blk stl ERW weld - 8" | 110 lf | 167.74 /lf | 18,451 |
| - Hydronic piping accessories | 18,368 lf | 2.53 /lf | 46,506 |
| **Hydronic Piping** | **136,600 sf** | **5.79 /sf** | **791,024** |
| **23.21.23 Hydronic Pumps & Accessories** | | | |
| Pump/base mount/790 gpm (HW) | 2 ea | 8,167.68 /ea | 16,335 |
| Chilled water pump house (pumps & accesories, enclosure, piping, unit heater | 1 ls | 226,667.68 /ls | 226,668 |
| - Suction diffusers | 2 ea | 1,460.58 /ea | 2,921 |
| - Flex connector/HVAC pumps | 4 ea | 556.35 /ea | 2,225 |
| - Triple duty valves | 2 ea | 2,312.69 /ea | 4,625 |
| Air separators | 1 ea | 4,333.84 /ea | 4,334 |
| Expansion tanks/ASME | 2 ea | 7,167.68 /ea | 14,335 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Hydronic Pumps & Accessories** | **136,600 sf** | **1.99 /sf** | **271,444** |
| **23.25.00 HVAC Water Treatment** | | | |
| Chemical treatment (lump sum) | 1 ls | 20,000.00 /ls | 20,000 |
| Glycol feed/50 gal. tank w/pump (Neptune #G-50-1) | 2 ea | 5,272.92 /ea | 10,546 |
| - Glycol solution/40% propylene | 1,000 gal | 25.21 /gal | 25,212 |
| **HVAC Water Treatment** | **136,600 sf** | **0.41 /sf** | **55,757** |
| **23.30.00 HVAC - Sheetmetal & Fans** | | | |
| Sheetmetal & accessories/galvanized | 101,200 lb | 11.04 /lb | 1,117,248 |
| Sheetmetal & accessories/galvanized (perforated) | 790 lb | 14.49 /lb | 11,447 |
| Sheetmetal & accessories/galvanized (smoke exhasut) | 8,850 lb | 11.04 /lb | 97,704 |
| Sheetmetal & accessories/stainless steel (dishwasher) | 350 lb | 22.28 /lb | 7,798 |
| Sheetmetal & accessories/welded stainless steel (kitchen exhaust) | 1,060 lb | 29.78 /lb | 31,567 |
| Sheetmetal & accessories/welded stainless steel (kiln exhaust) | 500 lb | 29.78 /lb | 14,890 |
| Sheetmetal & accessories/welded stainless steel (3 - fume hoods) | 2,700 lb | 29.78 /lb | 80,406 |
| Sheetmetal & accessories/fabric/1-row cable (DuctSox) - 20" | 405 lf | 76.50 /lf | 30,982 |
| Sheetmetal & accessories/fabric/1-row cable (DuctSox) - 24" | 305 lf | 81.29 /lf | 24,792 |
| Duct enclosure (roof) | 1 ea | 5,424.10 /ea | 5,424 |
| SM - Flue piping/double wall/stainless steel/6" pipe - linear foot DWH | 600 lf | 97.98 /lf | 58,786 |
| SM - Flue piping/double wall/stainless steel/6" fittings - each DWH | 16 ea | 122.47 /ea | 1,960 |
| SM - Flue piping/double wall/stainless steel/6" fittings - each DWH | 8 lf | 122.47 /lf | 980 |
| SM - Diffusers, registers & grilles | 136,600 sf | 0.20 /sf | 27,320 |
| SM - Linear slot diffusers (supply) | 6 ea | 465.39 /ea | 2,792 |
| *SM - Linear slot diffusers (exhaust) - architectural* | *lf* | */lf* | |
| SM - Displ. Diffuser/Floor Mnt. | 156 ea | 1,289.88 /ea | 201,221 |
| SM - Combination fire/smoke dampers/louver type/UL | 20 ea | 776.53 /ea | 15,530 |
| SM - Motorized damper | 14 ea | 1,107.92 /ea | 15,511 |
| SM - Smoke detectors/duct mount | 40 ea | 747.47 /ea | 29,899 |
| SM - Sound attenuators/in-line/std. gauge | 239,000 cfm | 0.55 /cfm | 131,341 |
| SM - Kitchen exhaust hood/st. steel/install only (by KES) | 1 ea | 2,339.28 /ea | 2,339 |
| SM - Dishwasher exhaust hood/st. steel/install only (by KES) | 1 ea | 1,559.52 /ea | 1,560 |
| **HVAC - Sheetmetal & Fans** | **136,600 sf** | **13.99 /sf** | **1,911,497** |
| **23.34.00 HVAC Fans - Exhaust & Supply** | | | |
| SEF-1-4 | 4 ea | 17,339.28 /ea | 69,357 |
| EF-3&4 /centrifugal downblast/roof/direct drive - 500 cfm | 2 ea | 1,069.31 /ea | 2,139 |
| EF-1&2 /centrifugal downblast/roof/direct drive - 2,500 cfm | 2 ea | 1,771.24 /ea | 3,542 |
| KEF-1&2/centrifugal upblast/roof | 2 ea | 2,734.82 /ea | 5,470 |
| FEF-1,2,3,4,5 Lab exhaust fan/roof - 1,200 cfm | 5 ea | 9,084.82 /ea | 45,424 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **HVAC Fans - Exhaust & Supply** | **136,600 sf** | **0.92 /sf** | **125,932** |
| **23.35.00 Specialty Exhaust Systems** | | | |
| Dust collection system | 1 ea | 17,339.28 /ea | 17,339 |
| Kiln exhaust | 1 ls | 5,500.00 /ls | 5,500 |
| **Specialty Exhaust Systems** | **136,600 sf** | **0.17 /sf** | **22,839** |
| **23.36.00 Air Terminal Units - VAV's, CAV's &FPB's** | | | |
| Variable air volume box - small | 12 ea | 533.15 /ea | 6,398 |
| Variable air volume box - medium | 143 ea | 668.62 /ea | 95,612 |
| **Air Terminal Units - VAV's, CAV's &FPB's** | **136,600 sf** | **0.75 /sf** | **102,010** |
| **23.50.00 HVAC - Central Heating Equipment** | | | |
| Boiler/HW/gas/high eff. cond. - 4,000 mbh Riello AR 4000 | 2 ea | 57,501.52 /ea | 115,003 |
| Boiler circulator pump | 2 ea | 1,708.46 /ea | 3,417 |
| Boiler combustion air/galvanized steel 10" | 200 lf | 38.00 /lf | 7,600 |
| Flue piping/double wall/stainless steel 10" | 205 lf | 185.00 /lf | 37,925 |
| **HVAC - Central Heating Equipment** | **136,600 sf** | **1.20 /sf** | **163,945** |
| **23.60.00 HVAC - Central Cooling Equipment** | | | |
| Chiller/air cooled - 370 tons | 1 ea | 381,153.80 /ea | 381,154 |
| Buffer tanks/Lochinvar - 300 gals. | 1 ea | 8,750.76 /ea | 8,751 |
| **HVAC - Central Cooling Equipment** | **136,600 sf** | **2.85 /sf** | **389,905** |
| **23.70.00 HVAC - Central Air Handling Equipment** | | | |
| RTU-1-4 Classrooms (service enclosure, HW&CHW coils, energy recovery) | 80,000 cfm | 15.75 /cfm | 1,260,000 |
| RTU-5 Gymnasium (service enclosure, HW&CHW coils, energy recovery) | 15,000 cfm | 16.25 /cfm | 243,750 |
| RTU-6 Auditorium (service enclosure, HW&CHW coils, energy recovery) | 12,000 cfm | 16.25 /cfm | 195,000 |
| RTU-7 Lockers (service enclosure, HW&CHW coils, energy recovery) | 2,000 cfm | 18.25 /cfm | 36,500 |
| MAU-1 Make-up air unit/HW&CHW coil/ | 5,000 cfm | 7.25 /cfm | 36,250 |
| **HVAC - Central Air Handling Equipment** | **136,600 sf** | **12.97 /sf** | **1,771,500** |
| **23.80.20 Mini-Split AC & Heat Pump Systems** | | | |
| Mini-split AC system/1-zone/wall mnt./cool only - 12 mbh | 1 ea | 2,072.92 /ea | 2,073 |
| Mini-split AC system/1-zone/wall mnt./cool only - 18 mbh | 5 ea | 2,681.66 /ea | 13,408 |
| Mini-split AC system/1-zone/wall mnt./cool only - 24 mbh | 2 ea | 2,956.03 /ea | 5,912 |
| Mini-split refrigeration line set/6-12 mbh - 50' | 2 ea | 584.88 /ea | 1,170 |
| Mini-split refrigeration line set/15-18 mbh - 50' | 10 ea | 599.88 /ea | 5,999 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **23.80.20 Mini-Split AC & Heat Pump Systems** | | | |
| Mini-split refrigeration line set/24-30 mbh - 50' | 4 ea | 614.88 /ea | 2,460 |
| Mini-split condensate drains/type"L" copper | 450 lf | 19.43 /lf | 8,744 |
| A/C cond. pump | 8 ea | 253.74 /ea | 2,030 |
| INS - Mini-split Insulation/copper pipe | 450 lf | 6.87 /lf | 3,090 |
| ATC - Mini-split condensing units (w/factory controls) | 8 ea | 879.76 /ea | 7,038 |
| ATC - Mini-split indoor units (w/factory controls) | 8 ea | 587.35 /ea | 4,699 |
| **Mini-Split AC & Heat Pump Systems** | **136,600 sf** | **0.42 /sf** | **56,622** |
| **23.82.00 Heating & Cooling Terminal Equipment** | | | |
| Radiant ceiling panels/24" wide - ft. | 1,450 lf | 120.00 /lf | 174,000 |
| FTR-2 Finned-tube radiation w/enclosure - 1 row | 260 lf | 194.24 /lf | 50,502 |
| FTR-1 Finned-tube radiation w/enclosure - 2 row | 570 lf | 259.37 /lf | 147,841 |
| FTR-3 Finned-tube radiation w/enclosure - 2 row | 40 lf | 297.49 /lf | 11,900 |
| Fin-tube radiation/electric - 2 kW | 8 ea | 739.88 /ea | 5,919 |
| Cabinet unit heater/hot water/wall mount/recessed - avg. size | 4 ea | 1,573.62 /ea | 6,294 |
| Cabinet unit heater/hot water/ceiling mount - avg. size | 10 ea | 1,749.51 /ea | 17,495 |
| Unit heater/hot water/horiz./propeller - avg. size | 2 ea | 1,092.41 /ea | 2,185 |
| **Heating & Cooling Terminal Equipment** | **136,600 sf** | **3.05 /sf** | **416,136** |
| **23.85.00 HVAC Equipment VFD's** | | | |
| Misc. VFD's | 1 ls | 35,000.00 /ls | 35,000 |
| VFD w/keypad/disconnect/bypass/NEMA 1 - HW pumps | 2 ea | 6,028.47 /ea | 12,057 |
| *VFD w/keypad/disconnect/bypass/NEMA 1 - CHW pumps w/ pump house* | *ea* | */ea* | |
| **HVAC Equipment VFD's** | **136,600 sf** | **0.34 /sf** | **47,057** |
| **23.90.00 HVAC Equipment Rigging/Setting/Start Up** | | | |
| Equipment hoisting/rigging/setting/start-up | 136,600 sf | 1.50 /sf | 204,900 |
| **HVAC Equipment Rigging/Setting/Start Up** | **136,600 sf** | **1.50 /sf** | **204,900** |
| **23-01 HVAC (TS)** | **136,600 sf** | **58.17 /sf** | **7,946,076** |
| **26-01 ELECTRICAL (TS)** | | | |
| **01.74.00 Cleaning & Waste Management** | | | |
| Lull, laborer for cleanup by Consigli (Electrical) | (1) ls | 230,000.00 /ls | (230,000) |
| Trade support - lull, laborer for cleanup (Electrical) | 1 ls | 230,000.00 /ls | 230,000 |
| **Cleaning & Waste Management** | **136,600 sf** | **/sf** | |
| **26.00.05 Electrical General Requirements** | | | |
| LEED Silver - premium (T.B.D.) | 1 ls | 9,400.00 /ls | 9,400 |
| Temp light stringers & GFCI power | 136,600 sf | 0.35 /sf | 47,810 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.00.05 Electrical General Requirements** | | | |
| Temp 480Y/277V electrical service (400A) | 3 ea | 18,226.22 /ea | 54,679 |
| Temp power for welders | 2 ea | 2,398.27 /ea | 4,797 |
| Temp power for trailers | 4 ea | 1,302.42 /ea | 5,210 |
| Temp internet connection for trailers | 4 ea | 1,854.17 /ea | 7,417 |
| Material handling / project mgmt. | 250 mh | 97.71 /mh | 24,428 |
| 3D/BIM coordination | 500 mh | 97.71 /mh | 48,856 |
| Record drawings / as-builts | 1 ea | 5,318.52 /ea | 5,319 |
| Seismic & testing (panels, generator, lighting control, fire alarm) | 1 ls | 18,800.00 /ls | 18,800 |
| Coring - patching - firestopping | 136,600 sf | 0.09 /sf | 12,840 |
| Project phasing (re-mobilization) | 1 ls | 9,400.00 /ls | 9,400 |
| Hoisting & rigging (generator & switchboard) | 2 ls | 7,050.00 /ls | 14,100 |
| **Electrical General Requirements** | **136,600 sf** | **1.93 /sf** | **263,055** |
| **26.05.05 Demolition for Electrical** | | | |
| Relocate existing emergency call box (provide new concrete base) | 1 ea | 2,994.80 /ea | 2,995 |
| Remove existing exterior site light fixture | 11 ea | 672.85 /ea | 7,401 |
| **Demolition for Electrical** | **136,600 sf** | **0.08 /sf** | **10,396** |
| **26.05.08 Electrical Distribution** | | | |
| Feeder (PVC/CU) - 150A [generator / LS] | 135 lf | 22.18 /lf | 2,994 |
| Feeder (PVC/CU) - 225A [generator / OS] | 135 lf | 33.46 /lf | 4,517 |
| Feeder (PVC/CU) - 400A [generator / LR] (exterior) | 135 lf | 56.93 /lf | 7,685 |
| Feeder (PVC/CU) - 2500A [secondary] | 105 lf | 414.00 /lf | 43,470 |
| Empty conduit - sch 40 PVC: 1 x 4" [generator] | 135 lf | 9.86 /lf | 1,330 |
| Empty conduit - sch 40 PVC: 1 x 4" [secondary / spare] | 105 lf | 9.86 /lf | 1,035 |
| Empty conduit - sch 40 PVC: 2 x 4" [primary] | 250 lf | 17.66 /lf | 4,415 |
| Magnetic warning tape - 1/8" | 875 lf | 4.37 /lf | 3,826 |
| Pole riser (GRC - 4"C) | 2 ea | 2,343.85 /ea | 4,688 |
| Electric manhole - 6'x12x7' | 1 ea | 6,773.56 /ea | 6,774 |
| Cast iron manhole frame/cover, 32"D x 6'H grade rings | 1 ea | 1,140.93 /ea | 1,141 |
| 12" x 12" x 12"D ground mounted pullbox (Quazite #PC1212HG00 w/ Cover) | 2 ea | 752.15 /ea | 1,504 |
| Hand hole & cover - 4'x4'x4' | 6 ea | 1,937.11 /ea | 11,623 |
| 17"x30"x12"D ground pullbox (Quazite #PC1730BA12 w/ cover) | 11 ea | 1,078.60 /ea | 11,865 |
| 24" x 36" x 24"D ground mounted pullbox (Quazite #Pg2436BC-24 w/ Cover) | 1 ea | 1,718.39 /ea | 1,718 |
| **Electrical Distribution** | **136,600 sf** | **0.80 /sf** | **108,584** |
| **26.05.26 Grounding & Bonding for Electrical Systems** | | | |
| Building grounding & bonding | 136,600 sf | 0.11 /sf | 15,408 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.05.26 Grounding & Bonding for Electrical Systems** | | | |
| Manhole / racking grounding & bonding | 1 ea | 701.05 /ea | 701 |
| Exterior (utility) transformer grounding & bonding | 1 ea | 1,066.05 /ea | 1,066 |
| Generator grounding & bonding | 1 ea | 1,066.05 /ea | 1,066 |
| SPD grounding (internal and external) | 47 ea | 120.29 /ea | 5,653 |
| Dry-type transformer grounding | 4 ea | 213.22 /ea | 853 |
| Copper ground bar - 2"x1/4" (ea.) | 5 ea | 280.03 /ea | 1,400 |
| Bare copper wire - #4/0 [duct bank] | 875 lf | 4.99 /lf | 4,368 |
| **Grounding & Bonding for Electrical Systems** | **136,600 sf** | **0.22 /sf** | **30,516** |
| **26.05.83 Equipment Wiring** | | | |
| Science Classrooms - CO system solenoid shutdown- 120V power & control wiring | 2 ea | 5,326.40 /ea | 10,653 |
| Kitchen - Ansul system - 120V power & control wiring | 1 ea | 10,237.00 /ea | 10,237 |
| Gym scoreboards and shot clocks - wiring only, F&I by Div. 11 | 2 ea | 5,344.80 /ea | 10,690 |
| Feeder (MC) - 20A (kitchen equipment - x42) | 3,150 lf | 5.75 /lf | 18,111 |
| Feeder (MC) - 30A (kitchen equipment - x2) | 200 lf | 5.87 /lf | 1,173 |
| 1" PVC - 30A (3#8 & #10G) | 250 lf | 10.29 /lf | 2,573 |
| Feeder (MC) - 40A (kitchen equipment - x1) | 100 lf | 7.01 /lf | 701 |
| Feeder (MC) - 60A (kitchen equipment - x2) | 200 lf | 10.55 /lf | 2,110 |
| Power for automatic temperature control panels (BMS) | 12 ea | 460.91 /ea | 5,531 |
| Electric heat trace power (cables, sensors, controllers by Div. 21 / 22) | 1,900 lf | 3.50 /lf | 6,650 |
| Service switch: 20A/3P, NEMA-1 | 1 ea | 107.43 /ea | 107 |
| Fused Disco: 20A/3P, NEMA-1 | 7 ea | 323.22 /ea | 2,263 |
| Fused Disco: 100A/3P, NEMA-1 | 2 ea | 1,185.41 /ea | 2,371 |
| Fused Disco: 200A/3P, NEMA-1 | 3 ea | 1,555.38 /ea | 4,666 |
| Fused Disco: 1000A/3P, NEMA-1 | 2 ea | 7,290.94 /ea | 14,582 |
| Wire gymnasum equipment SMC control stations (furnished by others) | 8 ea | 1,058.23 /ea | 8,466 |
| Electric vehicle charging station / dual pedestal / cable mgmt. | 3 ea | 10,512.40 /ea | 31,537 |
| Wire motors and controllers | 15 ea | 821.28 /ea | 12,319 |
| Kitchen equipment final connections (includes flexible whip) | 47 ea | 72.36 /ea | 3,401 |
| Mount & wire VFD's (furnished by Div. 23) | 8 ea | 646.55 /ea | 5,172 |
| MAU (5000cfm) - circuit / disconnect (3R) / connection | 1 ea | 2,503.41 /ea | 2,503 |
| RTU's - circuit / disconnect (3R) / connection (small) | 3 ea | 4,736.19 /ea | 14,209 |
| RTU's - circuit / disconnect (3R) / connection (large) | 4 ea | 7,010.29 /ea | 28,041 |
| Mini-split systems (indoor/outdoor) - circuits / disconnects (3R) / connections | 8 ea | 3,225.23 /ea | 25,802 |
| Chiller (370T) - circuit / disconnect (3R) / connection | 1 ea | 25,825.56 /ea | 25,826 |
| Smoke exhaust fans - circuit / disconnect / connection (100A) | 4 ea | 2,400.01 /ea | 9,600 |
| Kitchen exhaust fans - circuit / disconnect / connection | 2 ea | 1,420.91 /ea | 2,842 |
| Kiln exhaust system - circuit / disconnect / connection | 1 ea | 2,655.30 /ea | 2,655 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.05.83 Equipment Wiring** | | | |
| Dust collection system - circuit / disconnect / connection | 1 ea | 3,579.00 /ea | 3,579 |
| Fume hood exhaust fans - circuit / disconnect / connection | 5 ea | 1,214.10 /ea | 6,071 |
| Exhaust fans - circuit / disconnect / connection | 4 ea | 1,214.11 /ea | 4,856 |
| Power to electronic trap primers - 120V | 8 ea | 100.19 /ea | 801 |
| Hot water pumps - circuit / disconnect / connection | 2 ea | 1,673.87 /ea | 3,348 |
| Boilers - circuit / disconnect / connection | 2 ea | 1,204.71 /ea | 2,409 |
| Chilled water pump house pumps & heaters - circuits / disconnects / connections | 1 ls | 6,158.00 /ls | 6,158 |
| Hot water heater - circuit / service switch / connection | 1 ea | 591.53 /ea | 592 |
| Cabinet unit heaters - circuit / service switch / connection | 14 ea | 868.28 /ea | 12,156 |
| Unit heaters - circuit / service switch / connection | 2 ea | 868.28 /ea | 1,737 |
| Elevator sump pump - circuit / disconnect (3R) / connection | 1 ea | 1,247.28 /ea | 1,247 |
| Domestic boilers - circuit / disconnect (3R) / connection | 2 ea | 1,247.28 /ea | 2,495 |
| Recirculation pumps - circuit / disconnect / connection | 3 ea | 997.87 /ea | 2,994 |
| Glycol feed pumps - circuit / disconnect / connection | 2 ea | 997.87 /ea | 1,996 |
| Boiler circulation pumps - circuit / disconnect / connection | 2 ea | 997.87 /ea | 1,996 |
| Fin-tube radiators (2kW) - circuit / disconnect / connection | 8 ea | 1,847.40 /ea | 14,779 |
| VAV's - circuit / disconnect / connection | 155 ea | 298.83 /ea | 46,318 |
| Acid neutralization tanks / PH monitoring - circuit / connection | 2 ea | 965.80 /ea | 1,932 |
| **Equipment Wiring** | **136,600 sf** | **2.78 /sf** | **380,253** |
| **26.09.23 Lighting Control Devices** | | | |
| On-site programming & startup (manufacturer) | 1 ls | 3,913.41 /ls | 3,913 |
| Single pole switch (120/277V) | 13 ea | 65.04 /ea | 845 |
| Key op switch (120/277V) | 2 ea | 72.44 /ea | 145 |
| Three position momentary contact switch | 1 ea | 226.42 /ea | 226 |
| Ceiling PIR occupancy sensor (24VDC) | 323 ea | 247.23 /ea | 79,854 |
| Occupancy sensor power packs (120V) | 200 ea | 82.04 /ea | 16,408 |
| Wall dimmer switch (0-10V) | 227 ea | 131.04 /ea | 29,746 |
| Photocells (daylight harvesting) | 84 ea | 265.06 /ea | 22,265 |
| Universal dimming room controller, 1-channel | 50 ea | 536.88 /ea | 26,844 |
| ALCS master switching / dimming station | 1 ea | 821.83 /ea | 822 |
| Plug load controllers (20A/120V) | 50 ea | 300.80 /ea | 15,040 |
| Emergency lighting transfer (bypass relay) - non-dimming | 30 ea | 236.81 /ea | 7,104 |
| Lighting contactor - 12 pole (exterior lighting) | 1 ea | 1,899.98 /ea | 1,900 |
| Astronomical time clock | 1 ea | 919.97 /ea | 920 |
| Rough in for Theater Lighting - Allowance | 1 allw | 9,400.01 /allw | 9,400 |
| Power for Theater Lighting - Allowance | 1 allw | 28,199.87 /allw | 28,200 |
| Sub lighting control panels | 3 ea | 2,394.56 /ea | 7,184 |
| Master lighting control panel | 1 ea | 4,383.41 /ea | 4,383 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.09.23 Lighting Control Devices** | | | |
| Energy control unit | 1 ea | 2,157.58 /ea | 2,158 |
| System server unit | 1 ea | 1,316.75 /ea | 1,317 |
| Network Ethernet switch | 1 ea | 2,270.85 /ea | 2,271 |
| MC Cable (12/2) - 20A | 12,500 lf | 3.45 /lf | 43,126 |
| MC Cable (12/3) - 20A | 3,500 lf | 3.87 /lf | 13,541 |
| EMT (12/2) - 20A | 2,000 lf | 6.70 /lf | 13,404 |
| EMT (12/2) - 20A | 50 lf | 7.13 /lf | 356 |
| RJ45 Cable, 25LF (plenum-rated) | 407 ea | 72.10 /ea | 29,344 |
| RJ45 Cable, 50LF (plenum rated) | 228 ea | 111.05 /ea | 25,318 |
| **Lighting Control Devices** | **136,600 sf** | **2.83 /sf** | **386,033** |
| **26.10.00 Medium Voltage Electrical Distribution** | | | |
| Utility meter socket (meter by Util. Co.) | 1 ea | 289.66 /ea | 290 |
| CT meter enclosure for switchboard | 1 ea | 1,462.26 /ea | 1,462 |
| **Medium Voltage Electrical Distribution** | **136,600 sf** | **0.01 /sf** | **1,752** |
| **26.27.00 Low-Voltage Distribution Equipment** | | | |
| Circuit breaker - 20A/1P (panel) | 1 ea | 149.86 /ea | 150 |
| Switchboard: 3000A bus, 2500A rated MCB (100%), 480/277V, 3PH, 65kAIC | 1 ea | 45,417.04 /ea | 45,417 |
| Externally mounted SPD's | 6 ea | 3,131.70 /ea | 18,790 |
| Panelboard: 100A, 42-circuit | 14 ea | 2,550.41 /ea | 35,706 |
| Panelboard: 225A, 42-circuit | 9 ea | 3,420.66 /ea | 30,786 |
| Panelboard: 225A, 84-circuit | 9 ea | 4,338.66 /ea | 39,048 |
| Panelboard: 400A, 42-circuit | 3 ea | 5,435.74 /ea | 16,307 |
| Panelboard: 400A, 84-circuit | 1 ea | 10,724.46 /ea | 10,724 |
| Distribution panel: 600A | 2 ea | 9,886.92 /ea | 19,774 |
| Distribution panel: 800A | 3 ea | 12,443.25 /ea | 37,330 |
| Transformer: floor/wall - 75kVA, 480V:208V | 1 ea | 4,384.00 /ea | 4,384 |
| K-13 Transformer: floor - 225kVA, 480V:208V | 3 ea | 12,168.50 /ea | 36,506 |
| Engineered Services - Training (Manufacturer) | 1 ea | 4,165.70 /ea | 4,166 |
| Engineered Services - Start-Up Assistance (Manufacturer) | 1 ea | 3,519.08 /ea | 3,519 |
| **Low-Voltage Distribution Equipment** | **136,600 sf** | **2.22 /sf** | **302,606** |
| **26.27.05 Low-Voltage Distribution Feeders** | | | |
| Feeder (EMT/CU) - 20A [BMS to utility meter] | 200 lf | 7.43 /lf | 1,486 |
| Feeder (EMT/CU) - 20A [EP1A to Elevator Controller] | 125 lf | 7.43 /lf | 929 |
| Feeder (EMT/CU) - 60A [MSB to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [2DP1A to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [2DP1B to SPD] | 50 lf | 14.69 /lf | 735 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.27.05 Low-Voltage Distribution Feeders** | | | |
| Feeder (EMT/CU) - 60A [2DP1C to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 60A [4DP1B to SPD] | 50 lf | 14.69 /lf | 735 |
| Feeder (EMT/CU) - 90A [2DP1A to KPP1A] | 42 lf | 15.96 /lf | 670 |
| Feeder (EMT/CU) - 100A [MSB to LP1A] | 40 lf | 20.74 /lf | 830 |
| Feeder (EMT/CU) - 100A [4DP1B to LP1B] | 50 lf | 20.74 /lf | 1,037 |
| Feeder (EMT/CU) - 100A [4DP1C to LP1C] | 27 lf | 20.74 /lf | 560 |
| Feeder (EMT/CU) - 100A [4DP1B to LP2B] | 50 lf | 20.74 /lf | 1,037 |
| Feeder (EMT/CU) - 100A [2DP1A to LP2C] | 190 lf | 20.74 /lf | 3,940 |
| Feeder (EMT/CU) - 100A [4DP1B to LP3B] | 150 lf | 20.74 /lf | 3,111 |
| Feeder (EMT/CU) - 100A [4DP1C to LP3C] | 165 lf | 20.74 /lf | 3,422 |
| Feeder (EMT/CU) - 100A [MSB to LP1D] | 150 lf | 20.74 /lf | 3,111 |
| Feeder (EMT/CU) - 100A [EHP1A to Elevator Controller] | 125 lf | 20.74 /lf | 2,592 |
| Feeder (EMT/CU) - 100A [TEP1A to TEP2B] | 200 lf | 20.74 /lf | 4,148 |
| Feeder (EMT/CU) - 100A [TEP1A to TEP2C] | 200 lf | 20.74 /lf | 4,148 |
| Feeder (EMT/CU) - 100A [TEP1A to TEP1D] | 200 lf | 20.74 /lf | 4,148 |
| Feeder (EMT/CU) - 100A [TEP1A to UPS] | 50 lf | 20.74 /lf | 1,037 |
| Feeder (EMT/CU) - 100A [2DP1A to MP1A] | 410 lf | 20.74 /lf | 8,503 |
| Feeder (EMT/CU) - 125A [UPS to EP1A] | 150 lf | 20.99 /lf | 3,149 |
| Feeder (EMT/CU) - 150A [2DP1B to MP1B] | 50 lf | 26.82 /lf | 1,341 |
| Feeder (EMT/CU) - 150A [2DP1C to MSB] | 200 lf | 26.82 /lf | 5,365 |
| Feeder (EMT/CU) - 150A [2DP1C to MP3C] | 250 lf | 26.82 /lf | 6,706 |
| Feeder (EMT/CU) - 150A [2DP1B to PP2B] | 60 lf | 26.82 /lf | 1,609 |
| Feeder (EMT/CU) - 150A [2DP1C to PP2C] | 100 lf | 26.82 /lf | 2,682 |
| Feeder (EMT/CU) - 150A [2DP1B to PP1B] | 50 lf | 26.82 /lf | 1,341 |
| Feeder (EMT/CU) - 150A [2DP1C to MP1C] | 40 lf | 26.83 /lf | 1,073 |
| Feeder (EMT/CU) - 150A [2DP1C to PP2C] | 125 lf | 26.82 /lf | 3,353 |
| Feeder (EMT/CU) - 150A [2DP1C to PP3C] | 150 lf | 26.82 /lf | 4,024 |
| Feeder (EMT/CU) - 150A [4DP1C to PP3B] | 165 lf | 26.82 /lf | 4,426 |
| Feeder (EMT/CU) - 150A [2DP1C to PP1C] | 50 lf | 26.82 /lf | 1,341 |
| Feeder (EMT/CU) - 150A [2DP1A to PP1D] | 100 lf | 26.82 /lf | 2,682 |
| Feeder (EMT/CU) - 200A [MSB to ATS-LS] | 100 lf | 32.13 /lf | 3,213 |
| Feeder (EMT/CU) - 200A [ATS-LS to ELP1A] | 40 lf | 32.13 /lf | 1,285 |
| Feeder (EMT/CU) - 200A [2DP1A to PP1A] | 50 lf | 32.13 /lf | 1,607 |
| Feeder (EMT/CU) - 200A [Cam Lock Box to ATS-LS] | 60 lf | 32.13 /lf | 1,928 |
| Feeder (EMT/CU) - 225A [MSB to Dimming Rack HDP] | 250 lf | 46.72 /lf | 11,679 |
| Feeder (EMT/CU) - 225A [2DP1A to Dimming Rack SDP] | 200 lf | 46.72 /lf | 9,344 |
| Feeder (EMT/CU) - 225A [EHP1A to EHP3C] | 250 lf | 46.72 /lf | 11,679 |
| Feeder (EMT/CU) - 225A [MP3C to PP3C] | 45 lf | 46.72 /lf | 2,102 |
| Feeder (EMT/CU) - 225A [2DP1B to MP3B] | 100 lf | 46.72 /lf | 4,672 |
| Feeder (EMT/CU) - 225A [4DP1C to MHP3C] | 165 lf | 49.70 /lf | 8,200 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.27.05 Low-Voltage Distribution Feeders** | | | |
| Feeder (EMT/CU) - 225A [ATS-OS to EHP1A] | 200 lf | 49.70 /lf | 9,940 |
| Feeder (EMT/CU) - 225A [MSB to ATS-OS] | 75 lf | 49.70 /lf | 3,727 |
| Feeder (EMT/CU) - 400A [MSB to MHP1A] | 50 lf | 73.75 /lf | 3,688 |
| Feeder (EMT/CU) - 400A [EHP1C to EHP1A] | 100 lf | 73.75 /lf | 7,375 |
| Feeder (EMT/CU) - 400A [Generator to ATS-LR] (interior) | 430 lf | 73.75 /lf | 31,713 |
| Feeder (EMT/CU) - 400A [MSB to ATS-LR] | 375 lf | 78.46 /lf | 29,422 |
| Feeder (EMT/CU) - 400A [MHP-LR to ATS-LR] | 10 lf | 78.46 /lf | 785 |
| Feeder (EMT/CU) - 400A [ATS-LR to MHP-LR] | 50 lf | 73.75 /lf | 3,688 |
| Feeder (EMT/CU) - 600A [MSB to 4DP1B] | 200 lf | 108.91 /lf | 21,782 |
| Feeder (EMT/CU) - 600A [MSB to 2DP1A] | 70 lf | 108.91 /lf | 7,624 |
| Feeder (EMT/CU) - 800A [MSB to 2DP1C] | 125 lf | 138.78 /lf | 17,348 |
| Feeder (EMT/CU) - 800A [MSB to 4DP1C] | 200 lf | 138.78 /lf | 27,757 |
| Empty conduit (EMT) - 3/4" [utility meter to switchboard] | 75 lf | 6.28 /lf | 471 |
| Feeder (MC) - 125A [75kVA] | 30 lf | 12.82 /lf | 385 |
| Feeder (MC) - 225A [75kVA] | 30 lf | 35.43 /lf | 1,063 |
| Feeder (MC) - 400A [225kVA] | 90 lf | 59.32 /lf | 5,339 |
| Feeder (MC) - 800A [225kVA] | 90 lf | 111.65 /lf | 10,048 |
| M.I. Cable - 4-1/c #6 [ELP1B to ELP3B] | 150 lf | 36.15 /lf | 5,422 |
| M.I. Cable - 4-1/c #3 [EHP1A to EP3C] | 165 lf | 65.42 /lf | 10,794 |
| M.I. Cable - 4-1/c #3 [ELP1A to EDP] | 125 lf | 65.42 /lf | 8,178 |
| M.I. Cable - 4-1/c #3 [ELP1A to EP1C] | 125 lf | 65.42 /lf | 8,178 |
| M.I. Cable - 4-1/c #2 [EPL1A to ELP1B] | 150 lf | 72.60 /lf | 10,890 |
| M.I. Cable - 4-1/c #2 [ELP1A to ELP1D] | 417 lf | 77.24 /lf | 32,208 |
| Quick term kit - #6 4-1/c | 2 ea | 359.96 /ea | 720 |
| Quick term kit - #3 4-1/c | 6 ea | 710.21 /ea | 4,261 |
| Quick term kit - #2 4-1/c | 4 ea | 734.64 /ea | 2,939 |
| Brass plate (per hole) | 12 ea | 92.10 /ea | 1,105 |
| **Low-Voltage Distribution Feeders** | **136,600 sf** | **3.00 /sf** | **410,031** |
| **26.27.26 Wiring Devices** | | | |
| MC Cable (12/2) - 20A | 11,370 lf | 3.45 /lf | 39,227 |
| MC Cable (10/2) - 20A [homeruns - x372] | 24,180 lf | 4.36 /lf | 105,516 |
| EMT (12/2) - 20A | 2,000 lf | 6.70 /lf | 13,404 |
| PVC (10/2) - 20A | 450 lf | 6.68 /lf | 3,007 |
| Duplex receptacle - 20A - tamper resistant | 497 ea | 78.60 /ea | 39,065 |
| Duplex receptacle - 20A - switched with IO module | 14 ea | 67.78 /ea | 949 |
| Simplex receptacle - 20A [scoreboard control] | 2 ea | 70.18 /ea | 140 |
| Duplex receptacle - 20A - GFCI | 187 ea | 92.44 /ea | 17,286 |
| Duplex receptacle - 20A - GFCI - W.P. | 29 ea | 129.27 /ea | 3,749 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.27.26 Wiring Devices** | | | |
| Duplex receptacle - 20A [kitchen equipment] - circuitry in Equipment Wiring] | 33 ea | 67.79 /ea | 2,237 |
| Duplex receptacle - 20A [A/V] | 9 ea | 67.79 /ea | 610 |
| Duplex receptacle - 20A [CR] | 8 ea | 67.80 /ea | 542 |
| Exterior pedestal receptacle, GFI type, Wayne Tyler, Inc. #CB-BOX | 5 ea | 1,292.26 /ea | 6,461 |
| Quadruplex receptacle - 20A | 325 ea | 93.78 /ea | 30,479 |
| Quadruplex receptacle - 20A - switched with IO module | 18 ea | 93.79 /ea | 1,688 |
| Duplex receptacle - 20A - USB | 14 ea | 99.44 /ea | 1,392 |
| Specialty receptacle - 20A - L5-20R | 11 ea | 101.01 /ea | 1,111 |
| Specialty receptacle - 20A - L14-20R | 1 ea | 104.81 /ea | 105 |
| Specialty receptacle - 30A - L5-30R | 23 ea | 111.69 /ea | 2,569 |
| Quadruplex receptacle - 20A - GFCI | 5 ea | 143.12 /ea | 716 |
| Hardwired A/C junction (MC) - 20A [A/V] | 2 ea | 318.93 /ea | 638 |
| Hardwired A/C junction (MC) - 20A [fume hoods] | 4 ea | 318.93 /ea | 1,276 |
| Power junction w/feed (MC) - 20A [water coolers/bottle fillers] | 11 ea | 221.21 /ea | 2,433 |
| Power junction w/feed (MC) - 20A | 28 ea | 221.21 /ea | 6,194 |
| Trash compactor feed & connection | 2 ea | 2,243.92 /ea | 4,488 |
| Overhead door power & connection | 3 ea | 1,223.50 /ea | 3,671 |
| Dock leveler feed & connection | 1 ea | 3,532.90 /ea | 3,533 |
| Emergency power offs (EPO) | 10 ea | 295.11 /ea | 2,951 |
| Wiremold receptacles - G4 | 110 ea | 31.05 /ea | 3,416 |
| G4000 dual-channel wiremold - 24" spacing | 220 lf | 63.39 /lf | 13,945 |
| **Wiring Devices** | **136,600 sf** | **2.29 /sf** | **312,797** |
| **26.31.00 Provisions for Future Photovoltaic** | | | |
| Empty conduit - sch 40 PVC: 1 x 2" [future Canopy PV] | 280 lf | 26.88 /lf | 7,526 |
| Empty conduit - sch 40 PVC: 2 x 2" [future PV] | 1,250 lf | 35.04 /lf | 43,800 |
| Empty conduit - sch 40 PVC: 2 x 4" [future Canopy PV] | 160 lf | 45.14 /lf | 7,222 |
| **Provisions for Future Photovoltaic** | **136,600 sf** | **0.43 /sf** | **58,549** |
| **26.32.00 Packaged Generator Assemblies** | | | |
| Natural gas generator: 350kW / 437.5kVA | 1 ea | 133,322.25 /ea | 133,322 |
| Generator testing & start-up | 1 ea | 1,863.20 /ea | 1,863 |
| Generator annunciator panel | 1 ea | 1,447.40 /ea | 1,447 |
| Battery charger circuit (4#10 & 1#10G in 1"C) | 140 lf | 20.94 /lf | 2,932 |
| Jacket heater circuit | 140 lf | 34.49 /lf | 4,828 |
| Oil heater circuit | 140 lf | 53.66 /lf | 7,512 |
| Exterior W.P. sound attenuating enclosure (350kW) | 1 ea | 19,478.75 /ea | 19,479 |
| Remote status panel circuit | 140 lf | 9.64 /lf | 1,349 |
| Starting circuits - 2#14 MI cable | 140 lf | 12.76 /lf | 1,787 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.32.00 Packaged Generator Assemblies** | | | |
| Remote annunciator panel - 16#14 (EMT) | 100 lf | 15.81 /lf | 1,581 |
| Quick connect switch, ESL Storm Switch 3020 | 1 ea | 3,668.10 /ea | 3,668 |
| **Packaged Generator Assemblies** | **136,600 sf** | **1.32 /sf** | **179,769** |
| **26.33.00 Battery Equipment** | | | |
| UPS: 480-208/120V, 24kW (static ts,manual by-pass, 8min batt.BU) | 2 ea | 30,061.40 /ea | 60,123 |
| **Battery Equipment** | **136,600 sf** | **0.44 /sf** | **60,123** |
| **26.36.00 Transfer Switches** | | | |
| ATS-OS: 225A, 277/480V, 4P, no iso by-pass - open transition | 1 ea | 6,752.90 /ea | 6,753 |
| ATS-LS: 150A, 277/480V, 4P, w/ iso by-pass - open transition | 1 ea | 11,058.30 /ea | 11,058 |
| ATS-LR: 400A, 277/480V, 4P, w/ iso by-pass - open transition | 1 ea | 19,961.43 /ea | 19,961 |
| **Transfer Switches** | **136,600 sf** | **0.28 /sf** | **37,773** |
| **26.40.00 Electrical & Cathodic Protection** | | | |
| Lightning prevention system subcontractor | 1 ls | 30,000.00 /ls | 30,000 |
| **Electrical & Cathodic Protection** | **136,600 sf** | **0.22 /sf** | **30,000** |
| **26.50.00 Lighting** | | | |
| LK24: 2'x2' lay-in fixture [O] | 24 ea | 198.57 /ea | 4,766 |
| SPFL: LED flood light [C] | 20 ea | 682.90 /ea | 13,658 |
| SPNF: LED flood light, narrow [C] | 20 ea | 682.90 /ea | 13,658 |
| LR2 (emerg): 2' linear 2" aperature recessed luminaire [O] | 183 ea | 300.48 /ea | 54,987 |
| LR2: 2' linear 2" aperature recessed luminaire [O] | 912 ea | 300.48 /ea | 274,033 |
| G4: 4' linear rugged low profile 360 deg adjustable flood luminaire [O] | 80 ea | 2,155.93 /ea | 172,474 |
| LS4: 4' utility fixtre with frosted acrylic diffuser [O] | 20 ea | 246.16 /ea | 4,923 |
| LS4 (emerg): 4' utility fixture with frosted acrylic diffuser [O] | 14 ea | 246.16 /ea | 3,446 |
| LS8: 8' utility fixtre with frosted acrylic diffuser [O] | 11 ea | 411.94 /ea | 4,531 |
| LS4A (emerg): 4' utility fixtre with frosted acrylic diffuser [O] | 12 ea | 494.94 /ea | 5,939 |
| LS4A: 4' utility fixture with frosted acrylic diffuser [O] | 12 ea | 494.94 /ea | 5,939 |
| LP8 (emerg): Axis 8' LED fixture [O] | 9 ea | 1,027.94 /ea | 9,251 |
| LS8 (emerg): 8' utility fixture with frosted acrylic diffuser [O] | 10 ea | 411.94 /ea | 4,119 |
| JB: utility fixture with frosted tempered glass globe & guard [O] | 4 ea | 245.95 /ea | 984 |
| PC3: 6" down light fixture with dead-front gasketed trim [O] | 1 ea | 298.16 /ea | 298 |
| LRW (emerg): 6" aperature LED linear recessed fixture / qty. of 18 [C] | 114 lf | 146.99 /lf | 16,757 |
| PC1: 4" down light fixture, 0-10V dimming capable [O] | 24 ea | 298.16 /ea | 7,156 |
| RC1: 6" down light fixture [O] | 45 ea | 271.54 /ea | 12,219 |
| RC1 (emerg): 6" down light fixture [O] | 18 ea | 271.54 /ea | 4,888 |
| LS2 (emerg): 2' utility fixture [O] | 2 ea | 177.98 /ea | 356 |
| LSV4: 4' linear utility fixture with prismatic polcarbonate lens [C] | 4 ea | 675.93 /ea | 2,704 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **26.50.00 Lighting** | | | |
| RC2: 4" down light fixture, 0-10V dimming [O] | 8 ea | 230.56 /ea | 1,844 |
| LR4: 4' linear 2" aperature recessed luminaire with frosted lens [O] | 1 ea | 410.45 /ea | 410 |
| LUL: LED tape light with AL channel [C] | 1,840 lf | 88.49 /lf | 162,829 |
| LC3: linear cove Xeleum lighting / qty. of 96 [O] | 1,925 lf | 121.99 /lf | 234,826 |
| LWW: LED tape light with AL channel [C] | 1,408 lf | 88.49 /lf | 124,599 |
| RSH: 6" down light fixture with dead-front gasketed trim [O] | 1 ea | 306.54 /ea | 307 |
| LC2: linear cove fixture with frosted diffuser / qty. of 10 [O] | 76 lf | 148.23 /lf | 11,265 |
| PC2: 6" down light fixture with dead-front gasketed trim [O] | 28 ea | 298.16 /ea | 8,348 |
| LCL: LED tape light with AL channel [C] | 3,051 lf | 88.49 /lf | 269,994 |
| LSL: LED strip mounted on edge of stage / qty. of 1 | 59 lf | 305.95 /lf | 18,051 |
| Exit sign, ceiling mounted, double sided [O] | 34 ea | 196.16 /ea | 6,669 |
| Exit sign, ceiling mounted, single sided [O] | 16 ea | 183.16 /ea | 2,931 |
| Exit sign, wall mounted | 18 ea | 313.16 /ea | 5,637 |
| Exit sign, ceiling mounted, single sided - handicap [O] | 2 ea | 433.16 /ea | 866 |
| LRC (emerg): 6" aperature LED linear recessed fixture / qty. of 46 [C] | 596 lf | 161.70 /lf | 96,373 |
| MC Cable (12/2) - 20A (concealed branch) | 12,068 lf | 3.67 /lf | 44,291 |
| MC Cable (10/2) - 20A (concealed homeruns) | 2,400 lf | 4.64 /lf | 11,142 |
| EMT (12/2) - 20A (exposed branch) | 4,023 lf | 7.13 /lf | 28,679 |
| EMT (10/2) - 20A (exposed homeruns) | 500 lf | 8.58 /lf | 4,290 |
| **Lighting** | **136,600 sf** | **12.08 /sf** | **1,650,438** |
| **26.56.00 Exterior Lighting** | | | |
| SL4: LED egress / perimeter lighting fixture - custom color/finish [O] | 40 ea | 565.36 /ea | 22,614 |
| SL5: exterior ampitheater RGB projector, DMX capable, IP65 rated [O] | 8 ea | 3,626.85 /ea | 29,015 |
| SLS: LED recessed step light, 0-10V dimming capable [C] | 7 ea | 732.90 /ea | 5,130 |
| SL1: LED pole mounted luminaires mounted on a 20' pole [O] | 35 ea | 2,891.40 /ea | 101,199 |
| SL2A: exterior post top fixture with 15' round tapered alum pole [O] | 13 ea | 5,492.50 /ea | 71,403 |
| SL3: exterior bollard 43.3 cast illuminum [O] | 9 ea | 1,929.78 /ea | 17,368 |
| SL10: LED mini in-ground flood fixture capable of 0-10V dimming [O] | 12 ea | 978.60 /ea | 11,743 |
| MC Cable (12/2) - 20A | 1,200 lf | 3.67 /lf | 4,404 |
| EMT (12/2) - 20A | 1,400 lf | 7.13 /lf | 9,981 |
| 1" PVC - 30A (3#8 & #10G) | 6,900 lf | 10.95 /lf | 75,528 |
| 1" GRC - 90 Deg Sweep | 114 ea | 174.22 /ea | 19,861 |
| **Exterior Lighting** | **136,600 sf** | **2.70 /sf** | **368,247** |
| **27.00.01 Data/Voice/Audio-Video Communications** | | | |
| Tel/data J-hook system (plenum) | 136,600 sf | 0.19 /sf | 25,681 |
| Cable tray - 18"W (IDF/MDF only) | 200 lf | 75.55 /lf | 15,109 |
| Empty conduit (PVC) - 1" | 250 lf | 8.07 /lf | 2,016 |
| Empty conduit (EMT) - 2" | 650 lf | 11.19 /lf | 7,271 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **27.00.01 Data/Voice/Audio-Video Communications** | | | |
| Empty conduit (PVC) - 2" | 700 lf | 6.03 /lf | 4,223 |
| Empty conduit (sch 40 PVC) (4) 4"C (CATV, Telephone, FIber, Spare) | 220 lf | 32.32 /lf | 7,110 |
| Three (3) 1.25" inner ducts for fiber | 220 lf | 15.50 /lf | 3,411 |
| Communications utility pole conduit riser (GRC - 4"C) | 4 ea | 2,343.84 /ea | 9,375 |
| Copper ground bar w/isolators - 2"x1/4" | 4 ea | 280.03 /ea | 1,120 |
| Conduit sleeve w/ fireproofing - 4" | 20 ea | 201.11 /ea | 4,022 |
| Data outlet - (1) CAT-6A cable | 20 ea | 264.84 /ea | 5,297 |
| Data outlet - (1) CAT-6A cable [audio-visual] | 12 ea | 264.84 /ea | 3,178 |
| Data outlet - (2) CAT-6A cables | 131 ea | 466.16 /ea | 61,067 |
| Tel/data outlet - (3) CAT-6A cables | 91 ea | 652.82 /ea | 59,407 |
| Floor box tel/data outlet - (3) CAT-6A cables | 2 ea | 652.83 /ea | 1,306 |
| Voice outlet - (1) CAT-6A cable (WAP's by Owner) | 79 ea | 263.70 /ea | 20,832 |
| Wireless access point - (1) CAT-6A cable (WAP's by Owner) | 138 ea | 263.70 /ea | 36,390 |
| TVE - Video outlet | 56 ea | 838.75 /ea | 46,970 |
| TVC - Video outlet | 2 ea | 838.77 /ea | 1,678 |
| Double gang junction box with (4) 1" C | 54 ea | 482.68 /ea | 26,065 |
| FO - 12 strand SM | 1,750 lf | 5.27 /lf | 9,225 |
| FO - 12 strand MM | 1,500 lf | 7.10 /lf | 10,642 |
| 4-Post Full Height Rack | 10 ea | 1,170.17 /ea | 11,702 |
| Vertical cable wire manager | 20 ea | 314.09 /ea | 6,282 |
| Horizontal cable wire manager | 10 ea | 80.25 /ea | 803 |
| Copper patch panel - 96 port | 15 ea | 1,244.28 /ea | 18,664 |
| Fiber optic patch panel - 24 port | 6 ea | 570.06 /ea | 3,420 |
| Fiber enclosure (rack mtd.) | 6 ea | 485.85 /ea | 2,915 |
| Network switch - 24 port | 2 ea | 5,390.24 /ea | 10,780 |
| Telecom manhole & cover - 4'x6'x7' | 1 ea | 3,920.36 /ea | 3,920 |
| **Data/Voice/Audio-Video Communications** | **136,600 sf** | **3.07 /sf** | **419,882** |
| **27.40.00 Audio-Video Communications** | | | |
| S1: wall mounted loudspeaker - 1 gang metal box w/ cover | 2 ea | 228.33 /ea | 457 |
| S2: ceiling loud speaker - custom backbox | 6 ea | 308.23 /ea | 1,849 |
| S3: ceiling loud speaker - 4" SQ metal box w/ cover | 16 ea | 179.94 /ea | 2,879 |
| S4: ceiling loud speaker - 4" SQ metal box w/ cover | 2 ea | 251.94 /ea | 504 |
| S5: ceiling loud speaker - 4" SQ metal box w/ cover (New) | 2 ea | 245.27 /ea | 491 |
| D1: display back box, Chief PAC-526 | 3 ea | 371.35 /ea | 1,114 |
| F1: floor box, FSR FL-500P-6 floor box w/ finished cover | 1 ea | 469.58 /ea | 470 |
| V1: wall mounted video projector - 1 gang metal box w/ cover | 1 ea | 179.47 /ea | 179 |
| R1: receptacle panel - 2 gang metal box w/ cover | 3 ea | 242.43 /ea | 727 |
| R2: receptacle panel - 12"x12"x4" NEMA-1 enclosure w/ oversized flush | 2 ea | 242.43 /ea | 485 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **27.40.00 Audio-Video Communications** | | | |
| R3: receptacle panel - 3 gang metal box w/ cover | 4 ea | 311.69 /ea | 1,247 |
| R5: receptacle panel - 3 gang metal box w/ cover | 1 ea | 242.43 /ea | 242 |
| R6: receptacle panel - 12"x12"x4" NEMA-1 enclosure w/ oversized flush | 2 ea | 405.94 /ea | 812 |
| BP: wall mounted button panel - 1 gang metal box w/ cover | 3 ea | 221.77 /ea | 665 |
| J1: junction box - type 1 - 12"x12"x4" NEMA-1 enclosure w/ oversized flush | 2 ea | 723.57 /ea | 1,447 |
| J2: junction box - type 2 - 18"x18"x4" NEMA-1 enclosure w/ oversized flush | 1 ea | 844.78 /ea | 845 |
| J3: junction box - type 3 - same as Type 2 | 3 ea | 844.78 /ea | 2,534 |
| A1: Wall mounted antenna - 1 gang deep metal box w/ cover | 2 ea | 159.74 /ea | 319 |
| A2: Wall mounted antenna - 1 gang deep metal box w/ cover | 1 ea | 159.74 /ea | 160 |
| A3: Ceiling mounted antenna - 4" SQ metal box w/ cover | 2 ea | 138.32 /ea | 277 |
| A4: Ceiling mounted antenna - 4" SQ metal box w/ cover | 1 ea | 138.31 /ea | 138 |
| PS: Production communication speaker station - 4 gang deep metal box w/ cov | 5 ea | 385.28 /ea | 1,926 |
| PC: Production communication - 1 gang deep metal box w/ cover | 1 ea | 134.38 /ea | 134 |
| T1: Wall mounted touch panel - 3 gang metal box w/ cover | 2 ea | 249.04 /ea | 498 |
| VC: Wall mounted audio volume control - 1 gang deep metal box | 2 ea | 134.39 /ea | 269 |
| MC: Motor controller - 4" SQ metal box w/ cover | 3 ea | 86.46 /ea | 259 |
| C1: Wall mounted camera - 2 gang deep metal box w/ cover | 1 ea | 193.57 /ea | 194 |
| A/V Equipment Rack | 2 ea | 1,001.85 /ea | 2,004 |
| M1: Ceiling mounted microphone - 1 gang deep metal box w/ cover | 1 ea | 134.38 /ea | 134 |
| **Audio-Video Communications** | **136,600 sf** | **0.17 /sf** | **23,260** |
| **27.50.00 Distributed Communications & Monitoring Systems** | | | |
| Intercom sub-stations | 6 ea | 1,009.28 /ea | 6,056 |
| Intercom master-stations | 5 ea | 3,327.13 /ea | 16,636 |
| **Distributed Communications & Monitoring Systems** | **136,600 sf** | **0.17 /sf** | **22,691** |
| **27.51.19 Ceiling Speaker System** | | | |
| Speaker - ceiling mouted | 269 ea | 405.93 /ea | 109,194 |
| Speaker - wall mounted | 32 ea | 611.85 /ea | 19,579 |
| Volume control | 24 ea | 177.96 /ea | 4,271 |
| Power supply (80) units - speakers 24V DC | 4 ea | 2,661.71 /ea | 10,647 |
| PA console | 1 ea | 14,251.90 /ea | 14,252 |
| PA equipment power connection - 120V | 1 ea | 256.53 /ea | 257 |
| AM/FM/CD/DVD tuner | 1 ea | 694.40 /ea | 694 |
| Speaker system testing | 1 ea | 1,986.71 /ea | 1,987 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Ceiling Speaker System** | **136,600 sf** | **1.18 /sf** | **160,880** |
| **27.51.29 Emergency Communications Systems** | | | |
| Two way communication call box (recessed) | 20 ea | 799.75 /ea | 15,995 |
| Power supply w/battery back up | 1 ea | 1,714.28 /ea | 1,714 |
| Two way communication base station (28 zone) | 1 ea | 5,980.66 /ea | 5,981 |
| Power junction w/feed (EMT) - 20A | 1 ea | 337.91 /ea | 338 |
| Tel/data outlet - (1) CAT-6A cable | 20 ea | 264.84 /ea | 5,297 |
| Tel/data outlet - (2) CAT-6A cables | 1 ea | 466.16 /ea | 466 |
| Empty conduit (EMT) - 3/4" | 2,000 lf | 5.11 /lf | 10,218 |
| System testing | 1 ea | 1,016.70 /ea | 1,017 |
| **Emergency Communications Systems** | **136,600 sf** | **0.30 /sf** | **41,026** |
| **27.53.00 Clock System** | | | |
| Clock, wall mounted - 12" round | 126 ea | 283.06 /ea | 35,665 |
| Master clock w/ roof mounted antenna | 1 ea | 3,778.57 /ea | 3,779 |
| Wireless clock repeater | 1 ea | 647.06 /ea | 647 |
| Wireless clock transciever | 1 ea | 647.06 /ea | 647 |
| Program unit | 1 ea | 991.96 /ea | 992 |
| Speaker baffle, clock back box | 74 ea | 202.78 /ea | 15,006 |
| Wire guard | 20 ea | 57.70 /ea | 1,154 |
| Clock wiring (EMT) | 700 lf | 7.03 /lf | 4,923 |
| Clock wiring (RS-485 plenum) | 500 lf | 3.08 /lf | 1,540 |
| System testing | 1 ls | 33.83 /ls | 34 |
| **Clock System** | **136,600 sf** | **0.47 /sf** | **64,387** |
| **28.10.00 Electronic Access Control & Intrusion Detection** | | | |
| Card readers | 22 ea | 1,163.83 /ea | 25,604 |
| Card readers - W.P. | 3 ea | 1,967.78 /ea | 5,903 |
| Electro-magnetic lock | 6 ea | 657.91 /ea | 3,947 |
| Request to exit motion sensor | 26 ea | 322.33 /ea | 8,380 |
| Electric strike | 40 ea | 400.49 /ea | 16,020 |
| Thermal disconnecting means | 20 ea | 427.58 /ea | 8,552 |
| 24V power supply | 20 ea | 295.11 /ea | 5,902 |
| Junction box - 6"x6"x4" | 20 ea | 130.61 /ea | 2,612 |
| Power transfer hinge | 20 ea | 377.68 /ea | 7,554 |
| Intrusion digital keypads | 4 ea | 984.97 /ea | 3,940 |
| Dual tech motion detectors | 77 ea | 595.80 /ea | 45,876 |
| Door contacts | 63 ea | 465.74 /ea | 29,342 |
| Access control panel | 1 ea | 8,222.56 /ea | 8,223 |
| Tie in to lighting control system | 1 ea | 402.23 /ea | 402 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **28.10.00 Electronic Access Control & Intrusion Detection** | | | |
| Security wiring - cable | 7,500 lf | 3.80 /lf | 28,527 |
| Security wiring (EMT) | 2,250 lf | 8.53 /lf | 19,181 |
| Power junctions - 120V/20A | 2 ea | 193.20 /ea | 386 |
| Connect to CCTV system | 1 ea | 665.43 /ea | 665 |
| Proximity cards | 250 ea | 2.35 /ea | 588 |
| Software / licenses, programming, testing, startup (manufacturer) | 1 ea | 13,308.52 /ea | 13,309 |
| **Electronic Access Control & Intrusion Detection** | **136,600 sf** | **1.72 /sf** | **234,913** |
| **28.20.00 Video Surveillance** | | | |
| CCTV color monitors | 2 ea | 815.52 /ea | 1,631 |
| 360-degree multi-sensor interior cameras | 28 ea | 1,659.85 /ea | 46,476 |
| Dome I.P. camera - exterior | 19 ea | 1,996.28 /ea | 37,929 |
| Dome I.P. camera - interior - fixed | 27 ea | 1,471.85 /ea | 39,740 |
| 360-degree multi-sensor exterior cameras mounted on poles | 3 ea | 4,509.56 /ea | 13,529 |
| Camera monitoring station | 1 ea | 1,330.85 /ea | 1,331 |
| Video recorders | 2 ea | 3,131.71 /ea | 6,263 |
| Video switchers | 2 ea | 1,627.71 /ea | 3,255 |
| Camera wiring (EMT) | 2,500 lf | 8.76 /lf | 21,899 |
| Camera wiring (PVC) | 600 lf | 13.34 /lf | 8,003 |
| Camera wiring - cable | 7,400 lf | 4.04 /lf | 29,885 |
| Power junction - 120V/20A | 2 ea | 193.20 /ea | 386 |
| Software / licenses, programming, testing, startup (manufacturer) | 1 ea | 13,308.52 /ea | 13,309 |
| **Video Surveillance** | **136,600 sf** | **1.64 /sf** | **223,638** |
| **28.46.00 Temporary Fire Alarm** | | | |
| *Temporary fire alarm heat detection coverage / stairwell pull stations / temp notification - N/A* | - | /- | |
| Fire alarm impairment plan (NFPA-101) | 1 ls | 10,000.00 /ls | 10,000 |
| **Temporary Fire Alarm** | **136,600 sf** | **0.07 /sf** | **10,000** |
| **28.46.20 Fire Detection and Alarm** | | | |
| Elevator fire alarm interfacing | 1 ls | 5,000.00 /ls | 5,000 |
| Manual pull stations | 25 ea | 202.12 /ea | 5,053 |
| Smoke detectors | 82 ea | 220.39 /ea | 18,072 |
| Smoke detector w/ elevator recall | 3 ea | 373.26 /ea | 1,120 |
| Smoke detectors (for Atrium) | 89 ea | 220.39 /ea | 19,615 |
| Smoke detectors w/ elevator recall (for Atrium) | 3 ea | 373.25 /ea | 1,120 |
| Carbon monoxide detector (w/ monitor module) | 5 ea | 367.16 /ea | 1,836 |
| Beam detector (receiver & transmitter) | 5 ea | 416.88 /ea | 2,084 |
| Duct smoke detector (furnish & wire) | 40 ea | 838.91 /ea | 33,556 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **28.46.20 Fire Detection and Alarm** | | | |
| Remote test switch w/ indicating light | 40 ea | 194.88 /ea | 7,795 |
| Control modules | 20 ea | 265.75 /ea | 5,315 |
| Addressable monitor modules | 30 ea | 160.83 /ea | 4,825 |
| Tamper switch connection (via monitor module) | 8 ea | 560.06 /ea | 4,480 |
| Flow switch connection (via monitor module) | 8 ea | 403.67 /ea | 3,229 |
| Door hold device (magnetic) | 5 ea | 388.88 /ea | 1,944 |
| Wire motorized dampers (120V) | 14 ea | 407.48 /ea | 5,705 |
| Wire combination fire/smoke damper (120V & SLC) | 20 ea | 608.50 /ea | 12,170 |
| Strobe only | 48 ea | 175.36 /ea | 8,417 |
| Speaker/strobes | 150 ea | 246.56 /ea | 36,983 |
| Speaker/strobe - W.P. | 1 ea | 309.72 /ea | 310 |
| Horn/visual - wall mounted | 52 ea | 222.79 /ea | 11,585 |
| Exterior beacons (weatherproof) | 4 ea | 388.83 /ea | 1,555 |
| Fire alarm transponder panels | 6 ea | 928.51 /ea | 5,571 |
| Fire alarm annunciators w/ microphones | 3 ea | 2,107.39 /ea | 6,322 |
| FACP w/ 60-minute battery backup (Notifier NFS640) | 1 ea | 6,999.66 /ea | 7,000 |
| Masterbox (local energy) | 1 ea | 4,212.70 /ea | 4,213 |
| Key (Knox) box | 2 ea | 806.43 /ea | 1,613 |
| Smoke control panel | 1 ea | 19,502.56 /ea | 19,503 |
| Generator monitoring control panel | 1 ea | 571.80 /ea | 572 |
| Fire pump/jockey pump connection | 1 ea | 402.23 /ea | 402 |
| Fire alarm graphic maps | 3 ea | 1,454.56 /ea | 4,364 |
| Fire alarm comissioning | 1 ea | 6,158.00 /ea | 6,158 |
| Fire alarm testing (manufacturer) | 6 ea | 1,338.28 /ea | 8,030 |
| Fire alarm system programming | 397 ea | 20.79 /ea | 8,254 |
| FPLP cable (red) - #14-4/c | 11,475 lf | 2.23 /lf | 25,589 |
| FPLP cable (red) - #16-2/c | 12,330 lf | 1.83 /lf | 22,564 |
| EMT (red) - 3/4"C w/ #16-2/c (exposed) | 2,500 lf | 7.19 /lf | 17,981 |
| EMT (red) - 3/4"C w/ #14-4/c (exposed) | 1,200 lf | 7.95 /lf | 9,535 |
| Circuit integrity cabling (CIC) | 1,500 lf | 18.31 /lf | 27,465 |
| Ductbank w/ IMSA cable - 2" PVC | 320 lf | 16.30 /lf | 5,217 |
| **Fire Detection and Alarm** | **136,600 sf** | **2.72 /sf** | **372,120** |
| **28.46.24 Distributed Antenna System (DAS)** | | | |
| BDA system - parts & smarts (dual-frequency) | 136,600 sf | 0.47 /sf | 64,202 |
| BDA system - installation & minor material (dual-frequency) | 136,600 sf | 0.19 /sf | 25,681 |
| Directional couplers | 20 ea | 1,150.35 /ea | 23,007 |
| In-Line connectors | 20 ea | 249.01 /ea | 4,980 |
| Lightning protection units | 5 ea | 1,995.53 /ea | 9,978 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Distributed Antenna System (DAS)** | **136,600 sf** | **0.94 /sf** | **127,848** |
| **26-01 ELECTRICAL (TS)** | **136,600 sf** | **46.06 /sf** | **6,291,566** |
| **31-23 SITEWORK** | | | |
| **02.41.13 Demolition - Site** | | | |
| *Demo hydrants* | *BP#1* | */BP#1* | |
| *Demo bituminous concrete paving* | *BP#1* | */BP#1* | |
| *Demo bituminous walk* | *BP#1* | */BP#1* | |
| *Demo Temporary Bituminous Parking & Access Pavement* | *BP#1* | */BP#1* | |
| *Demo concrete sidewalks/pads/ramps* | *BP#1* | */BP#1* | |
| *Demo curbing* | *BP#1* | */BP#1* | |
| *Cut & cap site utilities - water* | *BP#1* | */BP#1* | |
| *Cut & cap site utilities - sewer* | *BP#1* | */BP#1* | |
| *Demo utility piping - water* | *BP#1* | */BP#1* | |
| *Demo utility piping - sewer* | *BP#1* | */BP#1* | |
| *Demo utility piping - electrical* | *BP#1* | */BP#1* | |
| *Demo utility piping - drain* | *BP#1* | */BP#1* | |
| *Demo utility piping - gas* | *BP#1* | */BP#1* | |
| *Demo drain structures* | *BP#1* | */BP#1* | |
| *Demo grease trap* | *BP#1* | */BP#1* | |
| *Demo fencing/guardrail* | *BP#1* | */BP#1* | |
| *Misc. site demolition* | *BP#1* | */BP#1* | |
| *Demo utility poles* | *BP#1* | */BP#1* | |
| **Demolition - Site** | **136,600 sf** | **/sf** | |
| **31.00.05 General Requirements** | | | |
| *Mobilizations* | *BP#1* | */BP#1* | |
| *Survey/layout* | *BP#1* | */BP#1* | |
| *Preconstruction survey and vibration monitoring & compliance* | *BP#1* | */BP#1* | |
| *Street plates for protection* | *BP#1* | */BP#1* | |
| *Police details* | *BP#1* | */BP#1* | |
| *Precast Concrete Jersey Barriers for Temp. Parking Lot* | *BP#1* | */BP#1* | |
| *Temporary site signage* | *BP#1* | */BP#1* | |
| *As-built plan preparation* | *BP#1* | */BP#1* | |
| *Localized dewatering* | *BP#1* | */BP#1* | |
| **General Requirements** | **136,600 sf** | **/sf** | |
| **31.10.00 Site Clearing** | | | |
| *Clear & grub, vegetation removal* | *BP#1* | */BP#1* | |
| *Strip & stockpile topsoil/loam* | *BP#1* | */BP#1* | |
| **Site Clearing** | **136,600 sf** | **/sf** | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **31.22.00 Grading** | | | |
| *Rough grading* | | *BP#1* | */BP#1* |
| *Fine grading - building SOG* | | *BP#1* | */BP#1* |
| *Fine grading - paving* | | *BP#1* | */BP#1* |
| *Fine grading - conc walks & site pads* | | *BP#1* | */BP#1* |
| *Fine grading - bituminous walks* | | *BP#1* | */BP#1* |
| **Grading** | **136,600 sf** | | **/sf** |
| **31.23.00 Excavation & Fill - Overall Site** | | | |
| *Cut to subgrade @ site* | | *BP#1* | */BP#1* |
| *Fill to subgrade from cut @ site* | | *BP#1* | */BP#1* |
| *Grind foundations for fill - In Demolition* | | *-* | */-* |
| *Fill to subgrade @ site - import* | | *BP#1* | */BP#1* |
| *Site cuts to stockpile for temporary parking & access layout* | | *BP#1* | */BP#1* |
| *Site surcharge* | | *BP#1* | */BP#1* |
| *Site cuts to site fills* | | *BP#1* | */BP#1* |
| *Excavation @ foundations* | | *BP#1* | */BP#1* |
| *Fill to subgrade @ building footprint - import (structural fill)* | | *BP#1* | */BP#1* |
| *Contaminated soil removal - unlined landfill* | | *BP#1* | */BP#1* |
| *Crushed stone base beneath S.O.G* | | *BP#1* | */BP#1* |
| *Crushed stone base beneath column & wall footings* | | *BP#1* | */BP#1* |
| **Excavation & Fill - Overall Site** | **136,600 sf** | | **/sf** |
| **31.23.01 Excavation & Fill - Foundations** | | | |
| *Excavate for elevator pits* | | *BP#1* | */BP#1* |
| *Fine grade under building* | | *BP#1* | */BP#1* |
| **Excavation & Fill - Foundations** | **136,600 sf** | | **/sf** |
| **31.23.02 Excavation & Fill - Utilities** | | | |
| *Excavate/backfill utilities under SOG by machine* | | *BP#1* | */BP#1* |
| **Excavation & Fill - Utilities** | **136,600 sf** | | **/sf** |
| **31.23.16 Rock Removal** | | | |
| *Rock removal - NIC* | | *-* | */-* |
| **Rock Removal** | **136,600 sf** | | **/sf** |
| **31.23.19 Dewatering** | | | |
| *Dewatering* | | *BP#1* | */BP#1* |
| *Construct Phase 2 Temp. Sediment Basins* | | *BP#1* | */BP#1* |
| *Additional dewatering* | | *BP#1* | */BP#1* |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Dewatering** | **136,600 sf** | **/sf** | |
| **31.25.00 Erosion & Sedimentation Control** | | | |
| *SWPPP (Prep of SWPPP by civil engineer)* | *BP#1* | */BP#1* | |
| *12"diameter Straw Wattles* | *BP#1* | */BP#1* | |
| *Silt sacks at catch basin* | *BP#1* | */BP#1* | |
| *Construction entrance* | *BP#1* | */BP#1* | |
| *Street sweeping* | *BP#1* | */BP#1* | |
| *Inspect / repair silt barrier weekly* | *BP#1* | */BP#1* | |
| *Remove erosion control measure at project completion* | *BP#1* | */BP#1* | |
| **Erosion & Sedimentation Control** | **136,600 sf** | **/sf** | |
| **31.62.00 Ground Improvement** | | | |
| *Site surcharge/rigid inclusion* | *BP#1* | */BP#1* | |
| *Rammed aggregate piers* | *BP#1* | */BP#1* | |
| *Rigid inclusions Gym and Auditorium* | *BP#1* | */BP#1* | |
| **Ground Improvement** | **136,600 sf** | **/sf** | |
| **32.11.00 Base Courses** | | | |
| *Gravel base course @ asphalt pavements* | *BP#1* | */BP#1* | |
| *Gravel base course @ Raised Stamped asphalt pavement at Flagg Drive* | *BP#1* | */BP#1* | |
| *Processed Aggregate base course - bituminous walks* | *BP#1* | */BP#1* | |
| *1 1/2" crushed stone base course - concrete walks & site pads* | *BP#1* | */BP#1* | |
| *Gravel base course - misc site amenities- (i.e.- curbing, swales,etc.)* | *BP#1* | */BP#1* | |
| **Base Courses** | **136,600 sf** | **/sf** | |
| **32.12.00 Flexible Paving** | | | |
| *Asphalt paving - (Parking Lots & Site Drives)* | *BP#1* | */BP#1* | |
| *Asphalt paving - Temp. Parking Layout* | *BP#1* | */BP#1* | |
| *Temporary roads and maintenance required during construction* | *BP#1* | */BP#1* | |
| *Asphalt paving - top course @ temporary to permanent* | *BP#1* | */BP#1* | |
| **Flexible Paving** | **136,600 sf** | **/sf** | |
| **32.13.00 Rigid Paving** | | | |
| *Stamped pavement at Flagg Drive* | *BP#1* | */BP#1* | |
| **Rigid Paving** | **136,600 sf** | **/sf** | |
| **32.16.13 Curbs & Gutters** | | | |
| *Precast concrete curbs* | *BP#1* | */BP#1* | |
| *Vertical granite curbs* | *BP#1* | */BP#1* | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **32.16.13 Curbs & Gutters** | | | |
| *Handicapped ramps at curbing* | | *BP#1* | */BP#1* |
| *Detectable Warning Plates at Handicapped Ramps* | | *BP#1* | */BP#1* |
| **Curbs & Gutters** | **136,600 sf** | | **/sf** |
| **32.16.23 Sidewalks** | | | |
| *Bituminous sidewalks* | | *BP#1* | */BP#1* |
| **Sidewalks** | **136,600 sf** | | **/sf** |
| **32.17.00 Paving Specialties** | | | |
| *Speed bumps - bituminous* | | *BP#1* | */BP#1* |
| *Pavement markings* | | *BP#1* | */BP#1* |
| *Parking signage* | | *BP#1* | */BP#1* |
| **Paving Specialties** | **136,600 sf** | | **/sf** |
| **33.10.00 Water Utilities** | | | |
| *Fire hydrants* | | *BP#1* | */BP#1* |
| *Fire hydrant - relocate existing* | | *BP#1* | */BP#1* |
| *Gate valves, tees, bends, thrust blocks, restraints* | | *BP#1* | */BP#1* |
| *Water distribution  connections to existing* | | *BP#1* | */BP#1* |
| *Water line - domestic* | | *BP#1* | */BP#1* |
| *Water line - hydrant & fire services* | | *BP#1* | */BP#1* |
| *Pressure test & chlorinate* | | *BP#1* | */BP#1* |
| **Water Utilities** | **136,600 sf** | | **/sf** |
| **33.30.00 Sanitary Sewerage Utilities** | | | |
| *Sanitary sewer piping* | | *BP#1* | */BP#1* |
| *Sanitary sewer manholes* | | *BP#1* | */BP#1* |
| *Connect to existing structures* | | *BP#1* | */BP#1* |
| *Utility and sewer tie-in at trailer* | | *BP#1* | */BP#1* |
| *Sanitary sewer testing - piping* | | *BP#1* | */BP#1* |
| *Video inspect incoming sewer, etc.* | | *BP#1* | */BP#1* |
| *Sanitary sewer testing - structures* | | *BP#1* | */BP#1* |
| **Sanitary Sewerage Utilities** | **136,600 sf** | | **/sf** |
| **33.36.00 Utility Septic Tanks** | | | |
| *Grease interceptor - In Plumbing* | | *-* | */-* |
| *Acid Neutralization - In Plumbing* | | *-* | */-* |
| **Utility Septic Tanks** | **136,600 sf** | | **/sf** |
| **33.40.00 Storm Drainage Utilities** | | | |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **33.40.00 Storm Drainage Utilities** | | | |
| *Catch basins* | | *BP#1* | */BP#1* |
| *Granite Curb Inlets* | | *BP#1* | */BP#1* |
| *Storm drainage manholes* | | *BP#1* | */BP#1* |
| *Outlet control structures* | | *BP#1* | */BP#1* |
| *Storm headwalls* | | *BP#1* | */BP#1* |
| *Stormceptors* | | *BP#1* | */BP#1* |
| *Storm drainage piping* | | *BP#1* | */BP#1* |
| *Rip Rap Splash Pads* | | *BP#1* | */BP#1* |
| *Weir Overflows* | | *BP#1* | */BP#1* |
| *Check dams* | | *BP#1* | */BP#1* |
| **Storm Drainage Utilities** | **136,600 sf** | | **/sf** |
| **33.46.00 Subdrainage** | | | |
| *Foundation drainage piping* | | *BP#1* | */BP#1* |
| **Subdrainage** | **136,600 sf** | | **/sf** |
| **33.47.00 Infiltration Systems** | | | |
| *Infiltration system* | | *BP#1* | */BP#1* |
| **Infiltration Systems** | **136,600 sf** | | **/sf** |
| **33.50.00 Fuel Distribution Utilities** | | | |
| *Excavation / backfill for gas line* | | *BP#1* | */BP#1* |
| **Fuel Distribution Utilities** | **136,600 sf** | | **/sf** |
| **33.70.00 Electrical Utilities** | | | |
| *Excavation/backfill for Emergency Generator ductbank* | | *BP#1* | */BP#1* |
| *Excavation/backfill for Primary Electric ductbank* | | *BP#1* | */BP#1* |
| *Excavation/backfill for Fire Alarm ductbank* | | *BP#1* | */BP#1* |
| *Excavation/backfill for Telcom ductbank* | | *BP#1* | */BP#1* |
| *Excavation/backfill for U.G. ductbank* | | *BP#1* | */BP#1* |
| *Excavation/backfill for 2"C Power Data ductbank (Amphitheather)* | | *BP#1* | */BP#1* |
| *Excavation/backfill for 2"C to IDF ductbank* | | *BP#1* | */BP#1* |
| *Concrete and rebar for electrical/telcom ductbanks* | | *BP#1* | */BP#1* |
| *Excavation/backfill for site lighting* | | *BP#1* | */BP#1* |
| *Emergency Call Box base* | | *BP#1* | */BP#1* |
| *EV Parking Station bases* | | *BP#1* | */BP#1* |
| *Light pole bases* | | *BP#1* | */BP#1* |
| *6" Concrete Filled Steel Pipe Bollards at Generator & Transformer Pads* | | *BP#1* | */BP#1* |
| **Electrical Utilities** | **136,600 sf** | | **/sf** |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **31-23 SITEWORK** | **136,600 sf** | **/sf** | |
| **32-10 LANDSCAPING & SITE IMPROVEMENTS** | | | |
| **12.93.00 Site Furnishings** | | | |
| Wood benches | 20 lf | 750.00 /lf | 15,000 |
| Bicycle Racks | 20 ea | 785.00 /ea | 15,700 |
| Basketball Poles & Hoops | 2 ea | 8,000.00 /ea | 16,000 |
| Miscellaneous site furnishings - Allowance | 1 ls | 30,000.00 /ls | 30,000 |
| **Site Furnishings** | **136,600 sf** | **0.56 /sf** | **76,700** |
| **32.01.90 Plant Maintenance** | | | |
| Landscaping maintenance | 1 yr | 8,000.00 /yr | 8,000 |
| **Plant Maintenance** | **136,600 sf** | **0.06 /sf** | **8,000** |
| **32.14.00 Unit Paving** | | | |
| Pavers - plaza paving | 260 sf | 25.00 /sf | 6,500 |
| Stone Dust at Raised Planter | 32 sf | 20.00 /sf | 640 |
| **Unit Paving** | **136,600 sf** | **0.05 /sf** | **7,140** |
| **32.18.00 Athletic & Recreational Surfacing** | | | |
| *Basketball Court Pavement- (3 1/2" Total Paving w/ Gravel Base) - BP#1* | *sf* | */sf* | |
| Basketball Court Pavement Markings | 1 ls | 2,000.00 /ls | 2,000 |
| **Athletic & Recreational Surfacing** | **136,790 sf** | **0.02 /sf** | **2,000** |
| **32.31.50 Walk / Road / Parking Appurtenances** | | | |
| Flag pole | 1 ea | 9,000.00 /ea | 9,000 |
| *Bollards - 6" steel w/concrete - BP#1* | *BP#1* | */BP#1* | |
| *Bollards - 6" steel w/concrete - BP#1* | *ea* | */ea* | |
| *Bollards - architectural - VM-C01* | *0 ea* | */ea* | |
| **Walk / Road / Parking Appurtenances** | **136,600 sf** | **0.07 /sf** | **9,000** |
| **32.32.00 Retaining Walls** | | | |
| Segmental retaining wall | 2,600 sf | 50.00 /sf | 130,000 |
| Additional segmental retaining wall per PR #12 | 220 sf | 50.00 /sf | 11,000 |
| **Retaining Walls** | **136,600 sf** | **1.03 /sf** | **141,000** |
| **32.80.00 Irrigation** | | | |
| *Irrigation system @ south sports field - by others* | *-* | */-* | |
| Irrigation @ ampitheater - Allowance | 23,435 sf | 2.00 /sf | 46,870 |
| Irrigation system @ north sports field - Allowance | 81,000 sf | 2.00 /sf | 162,000 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **Irrigation** | **136,600 sf** | **1.53 /sf** | **208,870** |
| **32.91.00 Planting Preparation** | | | |
| Mulch at trees and planting beds (3") | 240 cy | 105.00 /cy | 25,200 |
| Import loam & spread (6") at Lawns, Athletic Fields & Native Meadows | 5,594 cy | 40.00 /cy | 223,760 |
| Ammend & spread (6") at Lawns, Athletic Fields & Native Meadows | 6,030 cy | 12.00 /cy | 72,360 |
| Import loam & spread (6") at Detention Basins | 802 cy | 40.00 /cy | 32,080 |
| Import loam & spread (12") at Plant Beds | 375 cy | 40.00 /cy | 15,000 |
| Landscape Metal Edging at Building Mow Strip | 2,330 lf | 15.00 /lf | 34,950 |
| Building Mowing Strip- (Peastone) | 100 tn | 50.00 /tn | 5,000 |
| Import loam & spread (6") at Sodded Amphlitheather Lawns | 691 cy | 40.00 /cy | 27,640 |
| **Planting Preparation** | **136,600 sf** | **3.19 /sf** | **435,990** |
| **32.92.00 Turf & Grasses** | | | |
| Fine grade & hydroseed lawn areas | 119,420 sf | 0.30 /sf | 35,826 |
| Fine grade & seed (Native Wildflower Meadow) | 104,005 sf | 0.25 /sf | 26,001 |
| Fine grade & seed (Detention Basin Mix- Hydroseed) | 33,330 sf | 0.25 /sf | 8,333 |
| Fine grade & seed (Natural Turf Fields) | 259,269 sf | 0.25 /sf | 64,817 |
| Sod (Amphiltheather Lawns) | 28,719 sf | 1.50 /sf | 43,079 |
| Watering for sod areas | 1 ls | 7,500.00 /ls | 7,500 |
| Sod (100'x170') | 17,000 sf | 1.50 /sf | 25,500 |
| Sod northeast - phase 3 play area | 5,000 sf | 1.50 /sf | 7,500 |
| Watering for sod areas | 1 ls | 7,500.00 /ls | 7,500 |
| **Turf & Grasses** | **136,600 sf** | **1.66 /sf** | **226,056** |
| **32.93.00 Plants** | | | |
| Trees | 118 ea | 750.00 /ea | 88,500 |
| Shrubs (478 Total) | 7,736 sf | 8.50 /sf | 65,756 |
| Groundcover/perennials | 1,966 ea | 20.00 /ea | 39,320 |
| Planter Beds | 7,786 sf | 10.00 /sf | 77,860 |
| Rain garden | 8,275 sf | 10.00 /sf | 82,750 |
| **Plants** | **136,600 sf** | **2.59 /sf** | **354,186** |
| **32-10 LANDSCAPING & SITE IMPROVEMENTS** | **136,600 sf** | **10.75 /sf** | **1,468,942** |
| **32-31 FENCING** | | | |
| **32.31.00 Fences & Gates** | | | |
| *Wooden Guardrailing* | *BP#1* | */BP#1* | |
| *Fencing - N/A* | - | */-* | |
| 24' wide Single Arm Gate | 1 ea | 3,500.00 /ea | 3,500 |

| Description | Takeoff Quantity | Total Cost/Unit | Total Amount |
|---|---|---|---|
| **32.31.00 Fences & Gates** | | | |
| *Wooden Guardrailing - BP#1* | _____ *lf* | _____ */lf* | _____ |
| **Fences & Gates** | **136,600 sf** | **0.03 /sf** | **3,500** |
| **32-31 FENCING** | **136,600 sf** | **0.03 /sf** | **3,500** |

CONSIGLI

*Est. 1905*

| | |
|---|---|
| Job #: | **2043** |
| Project: | **Fuller Middle School** |
| Location: | **Framingham, MA** |
| Date: | **9/9/2019** |
| Proposal: | **General Requirements** |
| Gross Area (SF): | **157,000** |

| DESCRIPTION | Fuller Proposed GR | Early Site | Steel & Concrete Package | Remaining |
|---|---|---|---|---|
| **Temp Power - Allowance** | $ 125,000.00 | **$ 5,000.00** | **$ 5,000.00** | $ 115,000 |
| **Temp Heating - Allowance** | $ 80,000.00 | **$ 5,000.00** | **$ 20,000.00** | $ 55,000 |
| **Temp Heating Fuel - Allowance** | $ 50,000.00 | **$ 3,000.00** | **$ 17,000.00** | $ 30,000 |
| **Staging (Auditorium)** | $ 81,000.00 | | | $ 81,000 |
| **Dumpster - Allowance** | $ 125,000.00 | **$ 15,000.00** | **$ 15,000.00** | $ 95,000 |
| **Temp Toilets** | $ 20,000.00 | **$ 5,000.00** | **$ 6,000.00** | $ 9,000 |
| **Project Identification** | $ 10,000.00 | **$ 10,000.00** | **$ -** | $ - |
| **Temporary Barriers** | $ 40,000.00 | **$ 4,000.00** | | $ 36,000 |
| **Temp Fencing** | $ 248,520.00 | **$ 106,792.00** | **$ 57,688.00** | $ 84,040 |
| **Police Details - Allowance** | $ 30,000.00 | **$ 5,000.00** | **$ 10,000.00** | $ 15,000 |
| **Weather Protection - Allowance** | $ 170,000.00 | **$ 10,000.00** | **$ 50,000.00** | $ 110,000 |
| **Winter Conditions - Allowance** | $ 140,000.00 | **$ 5,000.00** | **$ 40,000.00** | $ 95,000 |
| **Carpenter Foreman** | $ 658,908.00 | **$ 85,866.00** | **$ 21,255.00** | $ 551,787 |
| **Labor Foreman** | $ 594,074.00 | **$ 87,362.00** | **$ 35,159.00** | $ 471,553 |
| **Temp Power - Allowance** | $ 20,000.00 | **$ 5,000.00** | **$ 2,500.00** | $ 12,500 |
| **Safety & First Aid** | $ 60,000.00 | **$ 14,000.00** | **$ 21,000.00** | $ 25,000 |
| **Temp. Fire Extinguishers** | $ 10,000.00 | **$ 1,000.00** | **$ 1,500.00** | $ 7,500 |
| **Temp Stair Towers** | $ 120,000.00 | | **$ 12,000.00** | $ 108,000 |
| **Roof Edge Protection** | $ 50,000.00 | | | $ 50,000 |
| **Pest Control** | $ 10,000.00 | **$ 10,000.00** | | $ - |
| **Building Layout** | $ 115,000.00 | **$ 21,000.00** | **$ 30,000.00** | $ 64,000 |
| **Final Cleaning - Interior** | $ 157,000.00 | | | $ 157,000 |
| **Final Cleaning - Glass - Interior** | $ 43,000.00 | | | $ 43,000 |
| **Final Cleaning - Glass - Exterior** | $ 43,000.00 | | | $ 43,000 |
| **Project and Site Traffic Signage (Temp)** | $ 20,000.00 | **$ 9,000.00** | **$ 11,000.00** | $ - |
| **Time Lapse Camera** | $ 17,000.00 | **$ 17,000.00** | | $ - |
| **Storage** | $ 15,000.00 | **$ 3,000.00** | **$ 3,000.00** | $ 9,000 |
| **Security** | $ 17,000.00 | **$ 5,000.00** | **$ 5,000.00** | $ 7,000 |
| **Air Quality Control** | $ 15,000.00 | | | $ 15,000 |
| **TOTAL GENERAL REQUIREMENT COSTS** | $ 3,084,502.00 | **$ 432,020.00** | **$ 363,102.00** | $ 2,289,380.00 |

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*Est. 1905*

ASSUMPTIONS & QUALIFICATIONS

# FULLER MIDDLE SCHOOL

90% CONSTRUCTION DOCUMENT ESTIMATE
SEPTEMBER 27, 2019

## GENERAL

1. Pricing is based on the following:
   - 90% Construction Document Pricing Drawings by Jonathan Levi Architects, dated September 9, 2019.
   - 90% Construction Document Pricing Drawings by Jonathan Levi Architects, dated September 9, 2019.
2. Testing and/or inspections are not included.
3. Builders Risk Insurance is included in the Amendment #1 GMP value.
4. Building permit cost is not included.
5. A Payment and Performance Bond is included in the Amendment #1 GMP value.
6. Sales tax is not included as this project is assumed to be tax exempt.
7. Subcontractor insurances are included per Consigli standard subcontract.
8. Utility company back charges, user fees, etc. (temporary electric, water, gas, etc.) are excluded.
9. Work hours are assumed to be normal business hours (7:00AM to 3:00PM) Monday to Friday. Overtime, phasing, or off-hours work costs are not included.
10. Breakouts provided are for informational/accounting purposes only. We reserve the right to reprice our estimate if changes are made to the scope of the project.
11. Site Security costs or provisions are not included.
12. Uniform Fire watch is not included.
13. An exterior mockup is included as an allowance.
14. All design is by the Owner's Designer. Delegated design is excluded.

## TRADE SPECIFIC

15. Hazardous material testing is not included.
16. Removal and/or relocation of furniture is not included.
17. Barrier-1 or similar concrete additives are not included.
18. The concrete floor at the Auditorium is included as polished per sheet A141D.
19. Exterior masonry work includes staging.
20. Interior brick veneer is not shown and therefore not included.
21. Fluid applied moisture mitigation is not included.
22. Resilient tile base is included as surface applied.
23. The Learning Commons stairs are included with rubber treads, risers, and landings.
24. CMU walls are not painted.
25. (3) fume hoods are included.
26. We have not included any costs or provisions for FF & E items and assume this will be by the Owner.
27. The orchestra enclosures are not included. These will be FF & E by the Owner.
28. Elevator operator costs are included.
29. Hydrant flow tests are not included and are assumed to have been previously completed to inform the fire protection design.

30. A Fire pump is not included.
31. A Domestic Booster pump is not included.
32. A Compressed Air System is not included.
33. Two (2) Gas Fired Domestic water heaters are included.
34. One (1) Domestic Storage tank is included.
35. Laboratory Hot Water piping is wrapped with heat maintenance cable.
36. Gas piping is included to (2) science labs 111A and 1114.
37. Ten (10) Gas Turrets are included.
38. Two (2) interior kitchen grease traps are included.
39. One (1) Exterior 8000 Gallon precast concrete grease trap is included.
40. Radon venting is not included.
41. Primary roof drains and storm piping is included.
42. Overflow secondary roof drains and piping is not included.
43. Interior under-slab drainage is not included.
44. A rainwater reclaim system is not included.
45. Six (6) Acid Neutralization local Chip Tanks are included.
46. Two (2) PH Monitoring panels and sensors are included.
47. Central Acid Neutralization and exterior pump stations are not included.
48. Rectangular, single-walled ductwork is included for supply air medium distribution.
49. VAV's do not include hot water re-heat coils.
50. Electrical and fire alarm permit fee costs are excluded (assumed waived by City of Framingham).
51. Primary cable, primary terminations, and exterior pad mount transformer by Utility Co.
52. Concealed lighting, power, and fire alarm branch circuitry is routed in MC Cable (per NEC Article 330).
53. Distribution feeders are routed in EMT and copper wire (where not required to be MI Cable).
54. Power, switch stations, and LV cable for twenty-five (25) motorized window treatment locations are included.
55. VFD's, motor starters, and motor controllers furnished by Division 23, installed and wired by Division 26.
56. Provisions for a future roof mounted photovoltaic (PV) system are included.
57. Two (2) central uninterruptible power supplies (UPS's) - 480V: 208/120V, 24kW (8 min. backup) - are included.
58. ATS's provided as open transition, with bypass isolation functionality included for legal-required and life-safety.
59. Cable tray is included for MDF and IDF's (200LF total); all other horizontal cabling routed across j-hooks.
60. Audio-visual devices, jacks, cabling, head end equipment, monitors, terminations and labor by Owner's Vendor.
61. Assistive classroom listening systems are not included.
62. Emergency pull-cord or call-for-aid systems are not included.
63. Motorized window treatment power and/or controls are excluded; none are shown on the electrical drawings.
64. Electrical floor boxes and poke-thru devices are not shown on power plans, and none are included in estimate.
65. Theatrical light fixtures, theatrical rigging, and theatrical lighting controls are included with theater equipment.
66. Electrical heat trace cabling system or power connections are not included.
67. Exterior site and building mounted lighting are included as shown on drawings E003-1 and E003-2.

68. Addressable fire alarm Notifier system shall be capable of voice evacuation via speaker/strobe appliances; a stand-alone mass notification system is not included.
69. Play field equipment is not included.
70. Fencing is not shown and therefore not included.

## ALLOWANCES

| | | |
|---|---|---|
| 71. | Exterior wall mockup (excluding Concrete and Steel). | $55,000 |
| 72. | Miscellaneous casework. | $136,600 |
| 73. | Miscellaneous rough carpentry. | $88,790 |
| 74. | Level 5 finish. | $63,750 |
| 75. | Miscellaneous specialties. | $34,150 |
| 76. | Food service equipment. | $415,270 |
| 77. | Sound systems. | $450,000 |
| 78. | Theater and stage equipment. | $416,921 |
| 79. | Miscellaneous lab equipment. | $25,000 |
| 80. | Theater lighting power and rough in. | $37,600 |
| 81. | Miscellaneous site furnishings. | $30,000 |
| 82. | Irrigation. | $208,870 |

# *Fuller Middle School*

Framingham, MA

**September 30, 2019**

**90% Construction Documents Estimate**

**Owner's Project Manager**

SMMA

1000 Massachusetts Ave.

Cambridge, MA

**Architect:**

Jonathan Levi Architects
266 Beacon Street
Boston, MA  02116

**Estimator:**

Miyakoda Consulting

PO Box 47

Raynham, MA  02767

(617) 799-5832

miyakoda CONSULTING

# *Fuller Middle School*

Fuller Middle School

## *INTRODUCTION*

### *Description:*

1. Construction of the Framingham Middle School
2. The scope of the work includes all related sitework, hardscape/landscape, and underground utilities

### *Particulars:*

1. 90% CD Drawings and Specifications dated September 9, 2019, received from Jonathan Levi Architects
2. Detailed quantity takeoff from these documents where possible
3. Experience with similar projects of this nature with JLA

### *Assumptions:*

1. The project will be constructed by a Construction Manager
2. Our costs assume that there will be at least three subcontractors submitting unrestricted bids in each sub-trade
3. Unit rates are based on current dollars
4. General Conditions and Requirements value covers Sub-Contractor's bond, site office overheads, and building permit applications
5. Fee markup is calculated on a percentage basis of direct construction costs. The value covers Contractor's bond, insurance and profit
6. Design and Pricing Contingency markup is an allowance for unforeseen design issues, design detail development and specification clarifications
7. Escalation has been included to midpoint of construction. The construction start date is June 2020.

### Exclusions:

1. Design fees and other soft costs
2. Owner's project administration
3. Construction of temporary facilities
4. Relocation expenses
5. Printing and advertising
6. Existing condition surveys and investigations
7. Work beyond the boundary of the site
8. Testing
9. Specialties, loose furnishings, fixtures and equipment beyond those noted
10. Preconstruction Fee
12. Traffic Improvements

# *Fuller Middle School*

Fuller Middle School
137,385 GSF

## *MAIN SUMMARY - NEW CONSTRUCTION*

| *DESCRIPTION* | | | *TOTAL* | *COST/SF* |
|---|---|---|---|---|
| **Direct Trade Costs With Site** | | | | |
| New Construction | 137,385 | GSF | $42,156,411 | $306.85 |
| Site Development | | | $2,564,406 | $18.67 |
| **Direct Trade Cost SubTotal** | | | **$44,720,817** | **$325.51** |
| Demolish Existing Building | 195,400 | GSF | $1,465,500 | $10.67 |
| Hazardous Waste Abatement (Budget provided) | | | $1,294,490 | $9.42 |
| **Building Cost Subtotal** | | | **$47,480,807** | **$345.60** |
| Design and Pricing Contingency | 3.00% | $47,480,807 | $1,424,424 | $10.37 |
| **Building Cost Total** | | | **$48,905,231** | **$355.97** |
| Escal. to Midpoint of Construction (Consigli %) | 1.3% | $48,905,231 | $655,330 | $4.77 |
| **Trade Cost SubTotal** | | | **$49,560,561** | **$360.74** |
| General Conditions | | | $2,931,033 | $21.33 |
| General Requirements | | | $2,289,380 | $16.66 |
| SDI (Non-Trade Contracts) | | | $269,858 | $1.96 |
| Sub Bonds (Trade Contracts) | | | $403,034 | $2.93 |
| General Liability Insurance | | | $576,109 | $4.19 |
| Construction Contingency | 2.50% | $49,560,561 | $1,239,014 | $9.02 |
| CM Fee | | | $1,152,218 | $8.39 |
| BP#1 | | | $10,957,843 | $79.76 |
| BP#2 | | | $8,738,800 | $63.61 |
| BP#2 Buy Savings | | | ($182,955) | ($1.33) |
| **Estimated Construction Cost Total** | | | **$77,934,895** | **$567.27** |

# *Fuller Middle School*

Fuller Middle School

## *DIRECT COST SUMMARY - NEW CONSTRUCTION*

| *DIV.* | *ELEMENTS* | *90%CD TOTAL* | *60%CD TOTAL* | DIFFERENCE | *% DIFF* |
|---|---|---|---|---|---|
| | | 137,385 GSF | 136,600 GSF | 785 GSF | 0.57% |
| **A-G** | ***BUILDING*** | | | | |
| ***A*** | ***SUBSTRUCTURES*** | | | | |
| A10 | FOUNDATIONS | | | | |
| | Foundations | $25,488 | $1,119,012 | ($1,093,524) | -97.72% |
| | Slab on Grade | $0 | $594,006 | ($594,006) | -100.00% |
| | FOUNDATIONS TOTAL | **$25,488** | **$1,713,019** | **($1,687,530)** | **-98.51%** |
| A20 | BASEMENT CONSTRUCTION | | | | |
| **A** | **SUBSTRUCTURES TOTAL** | **$25,488** | **$1,713,019** | **($1,687,530)** | **-98.51%** |
| ***B*** | ***SHELL*** | | | | |
| B10 | STRUCTURE | | | | |
| | Upper Floor Construction | $41,216 | $2,721,067 | ($2,679,851) | -98.49% |
| | Roof Construction | $357,300 | $2,333,165 | ($1,975,865) | -84.69% |
| | STRUCTURE TOTAL | **$398,516** | **$5,054,232** | **($4,655,716)** | **-92.12%** |
| B20 | EXTERIOR CLOSURE | | | | |
| | Exterior walls | $5,096,693 | $4,646,002 | $450,691 | 9.70% |
| | Exterior windows | $1,965,316 | $1,942,628 | $22,688 | 1.17% |
| | Exterior Doors | $232,200 | $213,200 | $19,000 | 8.91% |
| | EXTERIOR CLOSURE TOTAL | **$7,294,209** | **$6,801,830** | **$492,379** | **7.24%** |
| B30 | ROOFING | | | | |
| | Roof Coverngs | $2,582,461 | $2,265,314 | $317,147 | 14.00% |
| | ROOFING TOTAL | **$2,582,461** | **$2,265,314** | **$317,147** | **14.00%** |
| **B** | **SHELL TOTAL** | **$10,275,185** | **$14,121,376** | **($3,846,190)** | **-27.24%** |
| ***C*** | ***INTERIORS*** | | | | |
| C10 | INTERIOR CONSTRUCTION | | | | |
| | Partitions | $4,770,736 | $4,412,924 | $357,812 | 8.11% |
| | Interior Doors, frames & Hardware | $969,468 | $895,898 | $73,570 | 8.21% |
| | Fittings | $1,081,325 | $915,361 | $165,964 | 18.13% |
| | INTERIOR CONSTRUCTION TOTAL | **$6,821,528** | **$6,224,182** | **$597,346** | **9.60%** |

# *Fuller Middle School*

Fuller Middle School

## *DIRECT COST SUMMARY - NEW CONSTRUCTION*

| *DIV.* | *ELEMENTS* | *90%CD TOTAL* | *60%CD TOTAL* | DIFFERENCE | *% DIFF* |
|---|---|---|---|---|---|
| | | 137,385 GSF | 136,600 GSF | 785 GSF | 0.57% |
| C20 | STAIRCASES | | | | |
| | Staircases | $469,770 | $590,570 | ($120,800) | -20.45% |
| | STAIRCASES TOTAL | **$469,770** | **$590,570** | **($120,800)** | **-20.45%** |
| C30 | INTERIOR FINISHES | | | | |
| | Wall finishes | $1,776,276 | $1,767,241 | $9,035 | 0.51% |
| | Floor finishes | $1,301,453 | $1,288,200 | $13,253 | 1.03% |
| | Ceiling finishes | $1,927,926 | $1,858,543 | $69,383 | 3.73% |
| | INTERIOR FINISHES TOTAL | **$5,005,654** | **$4,913,983** | **$91,671** | **1.87%** |
| **C** | **INTERIORS TOTAL** | **$12,296,952** | **$11,728,735** | **$568,217** | **4.84%** |
| ***D*** | ***SERVICES*** | | | | |
| D10 | VERTICAL MOVEMENT | | | | |
| | Conveying System | $213,400 | $213,400 | $0 | 0.00% |
| | VERTICAL MOVEMENT TOTAL | **$213,400** | **$213,400** | **$0** | **0.00%** |
| D20 | PLUMBING | | | | |
| | Plumbing | $2,126,673 | $2,126,673 | $0 | 0.00% |
| | PLUMBING TOTAL | **$2,126,673** | **$2,126,673** | **$0** | **0.00%** |
| D30 | HVAC | | | | |
| | HVAC | $7,879,869 | $7,842,369 | $37,500 | 0.48% |
| | HVAC TOTAL | **$7,879,869** | **$7,842,369** | **$37,500** | **0.48%** |
| D40 | FIRE PROTECTION | | | | |
| | Fire Protection | $863,994 | $852,994 | $11,000 | 1.29% |
| | FIRE PROTECTION TOTAL | **$863,994** | **$852,994** | **$11,000** | **1.29%** |
| D50 | ELECTRICAL | | | | |
| | Service and distribution | $5,523,083 | $5,110,258 | $412,825 | 8.08% |
| | ELECTRICAL TOTAL | **$5,523,083** | **$5,110,258** | **$412,825** | **8.08%** |
| **D** | **SERVICES TOTAL** | **$16,607,018** | **$16,145,693** | **$461,325** | **2.86%** |
| ***E*** | ***EQUIPMENT AND FURNISHINGS*** | | | | |

# *Fuller Middle School*

Fuller Middle School

## *DIRECT COST SUMMARY - NEW CONSTRUCTION*

| *DIV.* | *ELEMENTS* | *90%CD TOTAL* | *60%CD TOTAL* | DIFFERENCE | *% DIFF* |
|---|---|---|---|---|---|
| | | 137,385 GSF | 136,600 GSF | 785 GSF | 0.57% |
| E10 | EQUIPMENT | | | | |
| | Institutional Equipment | $1,644,448 | $1,644,448 | $0 | 0.00% |
| | EQUIPMENT TOTAL | **$1,644,448** | **$1,644,448** | **$0** | **0.00%** |
| E20 | FURNISHINGS | | | | |
| | Specialties / Millwork | $1,307,320 | $1,609,546 | ($302,226) | -18.78% |
| | FURNISHINGS TOTAL | **$1,307,320** | **$1,609,546** | **($302,226)** | **-18.78%** |
| **D** | **EQUIPMENT AND FURNISHINGS TOTAL** | **$2,951,768** | **$3,253,994** | **($302,226)** | **-9.29%** |
| ***F*** | ***SPECIAL CONSTRUCTION & DEMO*** | | | | |
| F10 | SPECIAL CONSTRUCTION | | | | |
| | Special construction | $0 | $0 | $0 | 0.00% |
| | SPECIAL CONSTRUCTION TOTAL | **$0** | **$0** | **$0** | **0.00%** |
| F20 | SELECTIVE DEMOLITION | | | | |
| | Selectice Demolition | $0 | $0 | $0 | 0.00% |
| | SELECTIVE DEMOLITION TOTAL | **$0** | **$0** | **$0** | **0.00%** |
| **D** | **SPECIAL CONSTRUCTION & DEMO TOTAL** | **$0** | **$0** | **$0** | **$0** |
| **G** | **EQUIPMENT AND FURNISHINGS TOTAL** | **$4,427,652** | **$4,880,991** | **($453,339)** | **-9.29%** |
| **A-G** | **BUILDING TOTAL** | **$42,156,411** | **$46,962,817** | **($4,806,405)** | **-10.23%** |
| ***G*** | ***BUILDING SITEWORK*** | | | | |
| G10 | G10 SITE PREPARATION | | | | |
| | G1010 Site Clearing | $0 | $0 | $0 | #DIV/0! |
| | G1020 Site Demolition and Relocation | $0 | $0 | $0 | #DIV/0! |
| | G1030 Site Earthwork | $272,455 | $281,158 | ($8,703) | -3.10% |
| | G10 SITE PREPARATION TOTAL | **$272,455** | **$281,158** | **($8,703)** | **-3.10%** |
| G20 | G20 SITE IMPROVEMENTS | | | | |
| | G2020 Roadways | $0 | $0 | $0 | #DIV/0! |
| | G2030 Pedestrian Paving | $194,530 | $227,154 | ($32,624) | -14.36% |
| | G2040 Site Development | $771,744 | $975,872 | ($204,128) | -20.92% |

# *Fuller Middle School*

Fuller Middle School

## *DIRECT COST SUMMARY - NEW CONSTRUCTION*

| *DIV.* | *ELEMENTS* | *90%CD TOTAL* | *60%CD TOTAL* | *DIFFERENCE* | *% DIFF* |
|---|---|---|---|---|---|
| | | 137,385 GSF | 136,600 GSF | 785 GSF | 0.57% |
| | G2050 Landscaping | $862,545 | $826,078 | | 100.00% |
| | G20 SITE IMPROVEMENTS TOTAL | **$1,828,819** | **$2,029,104** | **($236,752)** | **-11.67%** |
| G30 | G30 SITE CIVIL/MECHANICAL UTILITIES | | | | |
| | G3010 Water Supply | $0 | $0 | $0 | #DIV/0! |
| | G3020 Sanitary Sewer | $0 | $0 | $0 | 100.00% |
| | G3030 Storm Sewer | $0 | $0 | $0 | #DIV/0! |
| | G3040 Heating Distribution | $0 | $0 | $0 | #DIV/0! |
| | G30 SITE CIVIL/MECHANICAL UTILITIES TOTAL | **$0** | **$0** | **$0** | **#DIV/0!** |
| G40 | G40 SITE ELECTRICAL UTILITIES | | | | |
| | G4010 Site Electrical Utilities | $463,132 | $476,743 | ($13,611) | -2.85% |
| | G40 SITE ELECTRICAL UTILITIES TOTAL | **$463,132** | **$476,743** | **($13,611)** | **-2.85%** |
| BP | BID PACKAGES | | | | |
| | BP#1 (Main Summary) | **$0** | **INCLUDED** | **$0** | 100.00% |
| | BP#2 (Main Summary) | **$0** | | | |
| | BID PACKAGES TOTAL | **$0** | | | **100.00%** |
| **G** | **BUILDING SITEWORK TOTAL** | **$2,564,406** | **$2,787,005** | **($259,066)** | **-9.30%** |
| | **CONSTRUCTION TRADE TOTAL** | **$44,720,817** | **$49,749,822** | **($5,065,471)** | **-10.18%** |
| | Demolish Existing Building | $1,465,500 | $1,465,500 | $0 | 0.00% |
| | Hazardous Waste Abatement (Budget provided) | $1,294,490 | $1,384,630 | ($90,140) | -6.51% |
| | Design and Pricing Contingency | $1,424,424 | $2,629,998 | ($1,205,574) | -45.84% |
| | **Building Cost** | **$48,905,231** | **$55,229,950** | **($3,544,176)** | **-6.42%** |
| | Escal. to Midpoint of Construction (June 2020 Start | $655,330 | $828,449 | ($173,119) | -20.90% |
| | **Trade Cost SubTotal** | **$49,560,561** | **$56,058,399** | **($5,182,383)** | **-9.24%** |
| | General Conditions | $2,931,033 | $3,401,447 | ($470,414) | -13.83% |
| | General Requirements | $2,289,380 | $2,652,483 | ($363,103) | -13.69% |
| | Builder's Risk | $0 | $0 | $0 | |
| | Traffic mitigation | $0 | $0 | $0 | |
| | SDI | $269,858 | $360,000 | ($90,142) | -25.04% |
| | Sub Bonds | $403,034 | $410,000 | ($6,966) | -1.70% |
| | General Liability Insurance | $576,109 | $668,571 | ($92,462) | -13.83% |
| | Performance & Payment Bond | $0 | $0 | $0 | |

# *Fuller Middle School*

Fuller Middle School

## *DIRECT COST SUMMARY - NEW CONSTRUCTION*

| *DIV.* | *ELEMENTS* | *90%CD TOTAL* | *60%CD TOTAL* | DIFFERENCE | *% DIFF* |
|---|---|---|---|---|---|
| | | 137,385 GSF | 136,600 GSF | 785 GSF | 0.57% |
| | Construction Contingency | $1,239,014 | $1,401,460 | ($162,446) | -11.59% |
| | CM Fee | $1,152,218 | $1,337,143 | ($184,925) | -13.83% |
| | | | $10,957,843 | | |
| | **Estimated Construction Cost Total** | **$77,934,895** | **$77,247,346** | **$687,549** | **0.89%** |

Gmail **Noriko Hall <norikohall@gmail.com>**

# Fuller - 90% CD Estimate Indirect Costs

1 message

**Lyons, Kristy** <klyons@consigli.com> Thu, Sep 26, 2019 at 4:30 PM
To: Peter Timothy <ptim@amfogarty.com>, Noriko Hall <norikohall@gmail.com>, "Ericson, Timothy" <tericson@consigli.com>
Cc: Joel Seeley <jseeley@smma.com>, "Smith, Robert" <rsmith@smma.com>, Philip Gray <pgray@leviarc.com>, Elizabeth Bugbee <ebugbee@leviarc.com>, "Riordan, Christian" <CRiordan@consigli.com>, "Batista, Matteo" <mbatista@consigli.com>, "Traniello, Sarah" <straniello@smma.com>

Pete and Noriko,

The total value for Bid Package #1, including our indirect costs, is $10,957,843.

The total value for Bid Package #2, including our indirect costs, is $8,738,800.

The total buy-savings for Bid Package #2 is ($182,955)

We are including these values at the bottom line of our estimate so that indirect adders are not factoring on the already bought scope. We recommend you do the same to streamline reconciliation.

Prorated values of indirect Lump Sum costs to include in your 90% CD estimate:

Balance of GCs: $2,931,033

Balance of GRs: $2,389,380

Balance of General Liability: $576,109

Balance of Fee: $1,152,218

Builders Risk and Payment & Performance bond for entire project are included in the BP#1 value.

See attached BP#1 & BP#2 GMP summaries for reference.

Bid Package #2 includes the steel at the locker guardrails and stairs 4&5. All other stairs should be included as Misc. Metals.

Any questions, please let us know. Thanks,

CONSIGLI
Est. 1905

**Kristy Lyons**
**Preconstruction Manager**
t: 508.458.0290 | m: 781.910.9565
consigli.com

**2 attachments**

**1.1 Fuller Middle School - Bid Package #1 06.17.19.pdf**
611K

**ECSP GMP #2 Summary_Consigli_Fuller.pdf**
121K

# *Fuller Middle School*

Fuller Middle School
137,385 GSF

## *DIRECT COST SUMMARY - NEW CONSTRUCTION*

| *DIV.* | *ELEMENTS* | *SITEWORK* | *BUILDING* | *TOTAL* | *$/GSF* |
|---|---|---|---|---|---|
| ***A*** | ***SUBSTRUCTURES*** | | | | |
| A10 | FOUNDATIONS | | | | |
| | Foundations | | $25,488 | $25,488 | $0.19 /GSF |
| | Slab on Grade | | $0 | $0 | $0.00 /GSF |
| | FOUNDATIONS TOTAL | | **$25,488** | **$25,488** | **$0.19 /GSF** |
| A20 | BASEMENT CONSTRUCTION | | $0 | $0 | |
| **A** | **SUBSTRUCTURES TOTAL** | | **$25,488** | **$25,488** | **$0.19 /GSF** |
| ***B*** | ***SHELL*** | | | | |
| B10 | STRUCTURE | | | | |
| | Upper Floor Construction | | $41,216 | $41,216 | $0.30 /GSF |
| | Roof Construction | | $357,300 | $357,300 | $2.60 /GSF |
| | STRUCTURE TOTAL | | **$398,516** | **$398,516** | **$2.90 /GSF** |
| B20 | EXTERIOR CLOSURE | | | | |
| | Exterior walls | | $5,096,693 | $5,096,693 | $37.10 /GSF |
| | Exterior windows | | $1,965,316 | $1,965,316 | $14.31 /GSF |
| | Exterior Doors | | $232,200 | $232,200 | $1.69 /GSF |
| | EXTERIOR CLOSURE TOTAL | | **$7,294,209** | **$7,294,209** | **$53.09 /GSF** |
| B30 | ROOFING | | | | |
| | Roof Coverngs | | $2,582,461 | $2,582,461 | $18.80 /GSF |
| | ROOFING TOTAL | | **$2,582,461** | **$2,582,461** | **$18.80 /GSF** |
| **B** | **SHELL TOTAL** | | **$10,275,185** | **$10,275,185** | **$74.79 /GSF** |
| ***C*** | ***INTERIORS*** | | | | |
| C10 | INTERIOR CONSTRUCTION | | | | |
| | Partitions | | $4,770,736 | $4,770,736 | $34.73 /GSF |
| | Interior Doors, frames & Hardware | | $969,468 | $969,468 | $7.06 /GSF |
| | Fittings | | $1,081,325 | $1,081,325 | $7.87 /GSF |
| | INTERIOR CONSTRUCTION TOTAL | | **$6,821,528** | **$6,821,528** | **$49.65 /GSF** |
| C20 | STAIRCASES | | | | |
| | Staircases | | $469,770 | $469,770 | $3.42 /GSF |

# *Fuller Middle School*

Fuller Middle School
137,385 GSF

## *DIRECT COST SUMMARY - NEW CONSTRUCTION*

| *DIV.* | *ELEMENTS* | *SITEWORK* | *BUILDING* | *TOTAL* | *$/GSF* |
|---|---|---|---|---|---|
| | STAIRCASES TOTAL | | **$469,770** | **$469,770** | **$3.42 /GSF** |
| C30 | INTERIOR FINISHES | | | | |
| | Wall finishes | | $1,776,276 | $1,776,276 | $12.93 /GSF |
| | Floor finishes | | $1,301,453 | $1,301,453 | $9.47 /GSF |
| | Ceiling finishes | | $1,927,926 | $1,927,926 | $14.03 /GSF |
| | INTERIOR FINISHES TOTAL | | **$5,005,654** | **$5,005,654** | **$36.44 /GSF** |
| **C** | **INTERIORS TOTAL** | | **$12,296,952** | **$12,296,952** | **$89.51 /GSF** |
| ***D*** | ***SERVICES*** | | | | |
| D10 | VERTICAL MOVEMENT | | | | |
| | Conveying System | | $213,400 | $213,400 | $1.55 /GSF |
| | VERTICAL MOVEMENT TOTAL | | **$213,400** | **$213,400** | **$1.55 /GSF** |
| D20 | PLUMBING | | | | |
| | Plumbing | | $2,126,673 | $2,126,673 | $15.48 /GSF |
| | PLUMBING TOTAL | | **$2,126,673** | **$2,126,673** | **$15.48 /GSF** |
| D30 | HVAC | | | | |
| | HVAC | | $7,879,869 | $7,879,869 | $57.36 /GSF |
| | HVAC TOTAL | | **$7,879,869** | **$7,879,869** | **$57.36 /GSF** |
| D40 | FIRE PROTECTION | | | | |
| | Fire Protection | | $863,994 | $863,994 | $6.29 /GSF |
| | FIRE PROTECTION TOTAL | | **$863,994** | **$863,994** | **$6.29 /GSF** |
| D50 | ELECTRICAL | | | | |
| | Service and distribution | | $5,523,083 | $5,523,083 | $40.20 /GSF |
| | ELECTRICAL TOTAL | | **$5,523,083** | **$5,523,083** | **$40.20 /GSF** |
| **D** | **SERVICES TOTAL** | | **$16,607,018** | **$16,607,018** | **$120.88 /GSF** |
| ***E*** | ***EQUIPMENT AND FURNISHINGS*** | | | | |
| E10 | EQUIPMENT | | | | |
| | Institutional Equipment | | $1,644,448 | $1,644,448 | $11.97 /GSF |
| | EQUIPMENT TOTAL | | **$1,644,448** | **$1,644,448** | **$11.97 /GSF** |

# *Fuller Middle School*

Fuller Middle School
137,385 GSF

## *DIRECT COST SUMMARY - NEW CONSTRUCTION*

| *DIV.* | *ELEMENTS* | *SITEWORK* | *BUILDING* | *TOTAL* | *$/GSF* |
|---|---|---|---|---|---|
| E20 | FURNISHINGS | | | | |
| | Specialties / Millwork | | $1,307,320 | $1,307,320 | $9.52 /GSF |
| | FURNISHINGS TOTAL | | **$1,307,320** | **$1,307,320** | **$9.52 /GSF** |
| **D** | **EQUIPMENT AND FURNISHINGS TOTAL** | | **$2,951,768** | **$2,951,768** | **$21.49 /GSF** |
| ***F*** | ***SPECIAL CONSTRUCTION & DEMOLITION*** | | | | |
| F10 | SPECIAL CONSTRUCTION | | | | |
| | Special construction | | $0 | $0 | $0.00 /GSF |
| | SPECIAL CONSTRUCTION TOTAL | | **$0** | **$0** | **$0.00 /GSF** |
| F20 | SELECTIVE DEMOLITION | | | | |
| | Selectice Demolition | | $0 | $0 | $0.00 /GSF |
| | SELECTIVE DEMOLITION TOTAL | | **$0** | **$0** | **$0.00 /GSF** |
| **D** | **SPECIAL CONSTRUCTION & DEMOLITION TOTAL** | | **$0** | **$0** | **$0.00 /GSF** |
| ***G*** | ***BUILDING SITEWORK*** | | | | |
| G10 | G10 SITE PREPARATION | | | | |
| | G1010 Site Clearing | $0 | | $0 | $0.00 /GSF |
| | G1020 Site Demolition and Relocation | $0 | | $0 | $0.00 /GSF |
| | G1030 Site Earthwork | $272,455 | | $272,455 | $1.98 /GSF |
| | G10 SITE PREPARATION TOTAL | **$272,455** | | **$272,455** | **$1.98 /GSF** |
| G20 | G20 SITE IMPROVEMENTS | | | | |
| | G2020 Roadways | $0 | | $0 | $0.00 /GSF |
| | G2030 Pedestrian Paving | $194,530 | | $194,530 | $1.42 /GSF |
| | G2040 Site Development | $771,744 | | $771,744 | $5.62 /GSF |
| | G2050 Landscaping | $862,545 | | $862,545 | $6.28 /GSF |
| | G20 SITE IMPROVEMENTS TOTAL | **$1,828,819** | | **$1,828,819** | **$13.31 /GSF** |
| G30 | G30 SITE CIVIL/MECHANICAL UTILITIES | | | | |
| | G3010 Water Supply | $0 | | $0 | $0.00 /GSF |
| | G3020 Sanitary Sewer | $0 | | $0 | $0.00 /GSF |
| | G3030 Storm Sewer | $0 | | $0 | $0.00 /GSF |
| | G3040 Heating Distribution | $0 | | $0 | $0.00 /GSF |
| | G30 SITE CIVIL/MECHANICAL UTILITIES TOTAL | **$0** | | **$0** | **$0.00 /GSF** |

# *Fuller Middle School*

Fuller Middle School
137,385 GSF

## *DIRECT COST SUMMARY - NEW CONSTRUCTION*

| *DIV.* | *ELEMENTS* | *SITEWORK* | *BUILDING* | *TOTAL* | *$/GSF* |
|---|---|---|---|---|---|
| G40 | G40 SITE ELECTRICAL UTILITIES | | | | |
| | G4010 Site Electrical Utilities | $463,132 | | $463,132 | $3.37 /GSF |
| | G40 SITE ELECTRICAL UTILITIES TOTAL | **$463,132** | | **$463,132** | **$3.37 /GSF** |
| BP | BID PACKAGES | | | | |
| | BP#1 (Main Summary) | | | $0 | $0.00 /GSF |
| | BP#2 (Main Summary) | | | $0 | $0.00 /GSF |
| | BID PACKAGES TOTAL | **$0** | **$0** | **$0** | **$0.00 /GSF** |
| **G** | **BUILDING SITEWORK TOTAL** | **$2,564,406** | **$0** | **$2,564,406** | **$18.67 /GSF** |
| | **CONSTRUCTION TRADE TOTAL** | **$2,564,406** | **$42,156,411** | **$44,720,817** | **$325.51 /GSF** |

# *Fuller Middle School*

Framingham, MA
137,385 GSF

## *DETAILED ESTIMATE - NEW CONSTRUCTION*

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 10 | ***A10 FOUNDATIONS*** | | | | |
| 11 | | | | | |
| 12 | **A1010 FOUNDATIONS** | | | | |
| 13 | *Earthwork* | | | | |
| 14 | Slab-on-Grade platform preparation in Sitework Tab | **66,213** | SF | | |
| 15 | Continuous footing w/foundation wall | **2,049** | LF | | |
| 16 | Excavation | **4,905** | CY | $12.00 | See below |
| 17 | Backfill from import | **4,215** | CY | $22.00 | See below |
| 18 | Spread footings | **133** | EA | | |
| 19 | Excavation | **977** | CY | $12.00 | See below |
| 20 | Backfill from import | | CY | $22.00 | See below |
| 21 | Elevator pit | **1** | EA | | |
| 22 | Excavation | **47** | CY | $12.00 | See below |
| 23 | Backfill from import | **18** | CY | $22.00 | See below |
| 24 | Disposal | | | | |
| 25 | Cast to off-site waste | **1,696** | CY | $22.00 | See below |
| 26 | Grade & compact | **66,213** | SF | $1.00 | See below |
| 27 | 12" base course sand & gravel below slab on grade | **2,452** | CY | $35.00 | See below |
| 28 | | | | | |
| 29 | Building overexcavation: | | | | |
| 30 | Over-excavation to remove topsoil | **12,262** | CY | $9.00 | |
| 31 | Over-excavation | **11,649** | CY | $8.50 | |
| 32 | Dispose materials | **6,131** | CY | $18.00 | |
| 33 | Structural fill | **5,242** | CY | $25.00 | |
| 34 | | | | | |
| 35 | Building Area | | | | |
| 36 | Cut and fill for building | **2,452.33** | CY | $8.00 | |
| 37 | 1' Gravel base to building | **2,452** | CY | $35.00 | |
| 38 | | | | | |
| 39 | *Concrete* | | | | |
| 40 | *Continuous footings; 3' x 1' 0" typ.* | ***2,049*** | *LF* | | |
| 41 | *4' x 1' 0"* | | | | |
| 42 | *5' x 1' 0"* | | | | |
| 43 | Concrete; material | **247** | CY | $135.00 | BP#2 |
| 44 | Concrete; place (combination of pumping/trucking) | **247** | CY | $95.00 | BP#2 |
| 45 | Reinforcement w/ftn wall dowels (10#/lf) | **20,490** | LB | $1.15 | BP#2 |
| 46 | Formwork | **8,196** | SF | $12.00 | BP#2 |
| 47 | *Spread footings* | ***133*** | *EA* | | |
| 48 | Concrete; material | **465** | CY | $135.00 | BP#2 |
| 49 | Concrete; place | **465** | CY | $95.00 | BP#2 |
| 50 | Reinforcement (100#/cy) | **46,500** | LB | $1.15 | BP#2 |
| 51 | Formwork | **6,406** | SF | $12.00 | BP#2 |
| 52 | Pilasters | **133** | EA | $1,100.00 | BP#2 |
| 53 | *Grade beam GB-1, GB-2* | ***288*** | *LF* | | |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | | TOTAL |
|---|---|---|---|---|---|---|
| 54 | Concrete; material | **57** | CY | $135.00 | BP#2 | |
| 55 | Concrete; place (combination of pumping/trucking) | **57** | CY | $95.00 | BP#2 | |
| 56 | Reinforcement (125#/cy) | **7,125** | LB | $1.15 | BP#2 | |
| 57 | Formwork | **1,940** | SF | $12.00 | BP#2 | |
| 58 | *Foundation and frost walls; 16" thick x 4' 0" high typ.* | ***8,551*** | *SF* | | | |
| 59 | Concrete; material | **443** | CY | $135.00 | BP#2 | |
| 60 | Concrete; place | **443** | CY | $95.00 | BP#2 | |
| 61 | Reinforcement (150#/cy) | **66,450** | LB | $1.15 | BP#2 | |
| 62 | Formwork | **17,212** | SF | $8.00 | BP#2 | |
| 63 | *Foundation walls; 21" thick x 4' 0" high typ.* | ***1,645*** | *SF* | | | |
| 64 | Concrete; material | **112** | CY | $135.00 | BP#2 | |
| 65 | Concrete; place | **112** | CY | $95.00 | BP#2 | |
| 66 | Reinforcement (150#/cy) | **16,800** | LB | $1.15 | BP#2 | |
| 67 | Formwork | **3,289** | SF | $8.00 | BP#2 | |
| 68 | Brick shelf | **2,049** | LF | $5.00 | BP#2 | |
| 69 | Elevator pit; slab and walls | **1** | EA | $5,000.00 | BP#2 | |
| 70 | Anchor bolts | **532** | SET | $35.00 | BP#2 | |
| 71 | 6" Ø hole through wall, backfill w/crushed stone | **4** | EA | $500.00 | BP#2 | |
| 72 | | | | | | |
| 73 | <u>*Bandshell*</u> | | | | | |
| 74 | Footing | *46* | *lf* | | | |
| 75 | Concrete; material | **7** | CY | $135.00 | BP#2 | |
| 76 | Concrete; place | **7** | CY | $95.00 | BP#2 | |
| 77 | Reinforing | **455** | LBS | $1.15 | BP#2 | |
| 78 | Formwork | **96** | SF | $9.00 | BP#2 | |
| 79 | Wall | *182* | *sf* | | | |
| 80 | Concrete | **10** | CY | $135.00 | BP#2 | |
| 81 | Placing | **10** | CY | $95.00 | BP#2 | |
| 82 | Reinforing | **1,500** | LBS | $1.15 | BP#2 | |
| 83 | Formwork | **382** | SF | $8.00 | BP#2 | |
| 84 | Concrete steps | **556** | LFR | $150.00 | BP#2 | |
| 85 | Concrete steps , amphitheatre steps | **385** | LFR | $125.00 | BP#2 | |
| 86 | Miscellaneous concrete | | | | | $0 |
| 87 | Ground improvements | | | | BP#1 | |
| 88 | | | | | | |
| 89 | *Special Foundation Conditions* | | | | | |
| 90 | Dewatering during excavation | | | | | BP#1 |
| 91 | | | | | | |
| 92 | *Thermal & Moisture Protection* | | | | | |
| 93 | 2" rigid insulation at foundation walls | **10,195** | SF | $2.50 | | $25,488 |
| 94 | Waterproofing elevator pit | **225** | SF | $18.00 | BP#2 | |
| 95 | Damp proofing to foundation walls | **10,195** | SF | $4.50 | BP#2 | |
| 96 | **A1010 FOUNDATIONS TOTAL** | | | | | **$25,488** |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | | TOTAL |
|---|---|---|---|---|---|---|
| 97 | | | | | | |
| 98 | **A1030 SLAB ON GRADE** | | | | | |
| 99 | *Concrete* | | | | | |
| 100 | *Slab on grade, 5" thick, WWF, top of slab 314' 0"* | ***66,213*** | *SF* | | | |
| 101 | Concrete; material | **1,030** | CY | $135.00 | BP#2 | |
| 102 | Concrete; place & finish | **66,213** | SF | $2.85 | BP#2 | |
| 103 | Reinforcement (6x6 mesh) | **76,145** | SF | $1.00 | BP#2 | |
| 104 | Slab depressions | **1,243** | LF | $65.00 | BP#2 | |
| 105 | Slab thickening at stair 5'x2'x1' deep | **6** | LOC | $2,500.00 | BP#2 | |
| 106 | *Slab on grade at loading dock, 6" thick, #4 bars* | ***350*** | *SF* | | | |
| 107 | Concrete; material | **6** | CY | $135.00 | BP#2 | |
| 108 | Concrete; place & finish | **350** | SF | $2.85 | BP#2 | |
| 109 | Reinforcement; #4@12"bew | **469** | LBS | $1.45 | BP#2 | |
| 110 | *Miscellaneous* | | | | | |
| 111 | Concrete ramp @ Auditorium | **2,440** | SF | $18.00 | BP#2 | |
| 112 | Sloped walkway @ Cohort/Learning Common/Stage | **320** | SF | $20.00 | BP#2 | |
| 113 | Housekeeping & mechanical equipment pads | **1** | LS | $5,000.00 | BP#2 | |
| 114 | Miscellaneous concrete | **1** | LS | $0.00 | BP#2 | |
| 115 | | | | | | |
| 116 | *Thermal & Moisture Protection* | | | | | |
| 117 | 2" rigid insulation to perimeter of slab | **6,392** | SF | $2.65 | BP#2 | |
| 118 | Vapor retarder under slab | **76,145** | SF | $1.00 | BP#2 | |
| 119 | **A1030 SLAB ON GRADE TOTAL** | | | | | **$0** |
| 120 | | | | | | |
| 121 | ***A10 FOUNDATIONS TOTAL*** | | | | | **$25,488** |
| 122 | | | | | | |
| 123 | | | | | | |
| 124 | ***A20 BASEMENT*** | | | | | |
| 125 | | | | | | |
| 126 | No anticipated work | | | | | |
| 127 | | | | | | |
| 128 | **TOTAL SYSTEM A20 BASEMENT** | | | | | **$0** |
| 129 | | | | | | |
| 130 | | | | | | |
| 131 | ***B10 STRUCTURE*** | | | | | |
| 132 | | | | | | |
| 133 | **B1010 UPPER FLOOR CONSTRUCTION** | | | | | |
| 134 | *Concrete* | | | | | |
| 135 | *Slab on deck topping, 3 ¼" light weight, WWF* | *69,572* | *SF* | | | |
| 136 | Concrete; material | **966** | CY | $135.00 | BP#2 | |
| 137 | Reinforcement (6x6 mesh) | **76,529** | SF | $1.00 | BP#2 | |
| 138 | Rebar at corners and openings | **3,826** | LBS | $1.15 | BP#2 | |
| 139 | Concrete; place & finish | **69,572** | SF | $5.00 | BP#2 | |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 140 | Beam pocket | **23** | EA | $750.00 | BP#2 |
| 141 | | | | | |
| 142 | *Concrete* | | | | |
| 143 | *Slab on deck topping, 3 ¼" light weight, WWF* | *1,600* | *SF* | | |
| 144 | Concrete; material | **22** | CY | $135.00 | BP#2 |
| 145 | Reinforcement (6x6 mesh) | **1,760** | SF | $1.00 | BP#2 |
| 146 | Rebar at corners and openings | **88** | LBS | $1.15 | BP#2 |
| 147 | Concrete; place & finish | **1,600** | SF | $5.00 | BP#2 |
| 148 | | | | | |
| 149 | *Structural Steel Framing* | *793* | *TNS* | | |
| 150 | *Steel floor framing* | | | | |
| 151 | Wide flange beams | **243** | TNS | $3,700.00 | BP#2 |
| 152 | Wide flange beams > 100 | **36** | TNS | $3,950.00 | BP#2 |
| 153 | HSS-shapes | **47** | TNS | $4,150.00 | BP#2 |
| 154 | W-shapes ; columns | **14** | TNS | $3,950.00 | BP#2 |
| 155 | HSS-shapes; columns | **101** | TNS | $4,150.00 | BP#2 |
| 156 | HSS brace frames | **40** | TNS | $4,250.00 | BP#2 |
| 157 | Remainder of steel framing; beams, columns, bridging | **26** | TNS | $4,150.00 | BP#2 |
| 158 | Plates, bent plates and angles | **133** | EA | $75.00 | BP#2 |
| 159 | Moment connections | **157** | EA | $750.00 | BP#2 |
| 160 | Shear studs | **10,170** | EA | $5.50 | BP#2 |
| 161 | 3" deep x 18ga galv composite floor deck | **71,172** | SF | $4.25 | BP#2 |
| 162 | *Thermal & Moisture Protection* | | | | |
| 163 | Firestopping | **137,385** | GSF | $0.30 | $41,216 |
| 164 | Intumescent fireproofing | | | | See Roof |
| 165 | **B1010 UPPER FLOOR CONSTRUCTION TOTAL** | | | | **$41,216** |
| 166 | | | | | |
| 167 | **B1020 ROOF CONSTRUCTION** | | | | |
| 168 | *Structural steel roof framing* | *286* | *TNS* | | |
| 169 | Wide flange beams | **124** | TNS | $3,650.00 | BP#2 |
| 170 | Wide flange beams > 100 | **87** | TNS | $3,900.00 | BP#2 |
| 171 | HSS-shape | **18** | TNS | $4,100.00 | BP#2 |
| 172 | Support post HSS7.625x0.375; RTU screen | **2** | TNS | $4,100.00 | BP#2 |
| 173 | L- ledger; L4x4x1/4 anchored to CMU, roof | **1** | TNS | $3,550.00 | BP#2 |
| 174 | Roof steel framing incl's hanger support beam, 52DLH17, HSS trusses, 1"x10" 50KSI steel plate, etc. | **42** | TNS | $4,100.00 | BP#2 |
| 175 | Add reinforcement 7#/sf hot dip galv steel @ RTU | **12** | TNS | $4,100.00 | BP#2 |
| 176 | Moment connections | **241** | EA | $750.00 | BP#2 |
| 177 | Roof hanger @ main roof | **47** | EA | $1,500.00 | BP#2 |
| 178 | 3/4" rod hanger @ Gym and Auditorium roof | **11** | EA | $1,500.00 | BP#2 |
| 179 | Other misc plates, connections | **65,518** | SF | $4.50 | BP#2 |
| 180 | *Premium for galv steel framing* | **14** | TNS | $500.00 | BP#2 |
| 181 | 3" deep x 18ga galv comp roof deck (w/conc topping) | **40,338** | SF | $4.25 | BP#2 |

# *Fuller Middle School*

Framingham, MA
137,385 GSF

## *DETAILED ESTIMATE - NEW CONSTRUCTION*

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 182 | R3; 3" 18 ga roof deck above Learning Commons | **8,610** | SF | $4.25 | BP#2 |
| 183 | R3C; 3" Cellular 18/16 ga roof deck, galv at Auditorium | **7,615** | SF | $4.25 | BP#2 |
| 184 | R1.5; 1.5" 20 ga roof deck, Gym equipment storage | **835** | SF | $6.00 | BP#2 |
| 185 | R1.5A; 1.5" Cellular acoustic 20 ga roof deck, galv at Gym | **8,120** | SF | $6.50 | BP#2 |
| 186 | 1 hr spray fireproofing @ raised roof area over Learning Commons | **8,610** | SF | $5.00 | $43,050 |
| 187 | Intumescent fireproofing | **1** | LS | $65,000.00 | $65,000 |
| 188 | Rough blocking to roof | | | | Div B3010 |
| 189 | Roof dunnage (SS) | **7** | TNS | $7,500.00 | $52,500 |
| 190 | Roof screen, galv; HSS shapes | **15** | TNS | $3,950.00 | $59,250 |
| 191 | Galvanized bar grating | **1,000** | SF | $55.00 | $55,000 |
| 192 | Roof soffit/fascia framing | **500** | LF | $165.00 | $82,500 |
| 193 | **B1020 ROOF CONSTRUCTION TOTAL** | | | | **$357,300** |
| 194 | | | | | |
| 195 | ***TOTAL SYSTEM B10 SUPERSTRUCTURE*** | | | | **$398,516** |
| 196 | | | | | |
| 197 | | | | | |
| 198 | ***B20 EXTERIOR CLOSURE*** | **70,150** | SF | | |
| 199 | | | | | |
| 200 | **B2010 EXTERIOR WALLS** | **57,695** | | | |
| 201 | | | | | |
| 202 | Exterior brick wall; scored brick veneer, "modular" 8x8x4 , and "utility" 4x12x4, iron spot finish | **17,333** | SF | $35.00 | $606,655 |
| 203 | 3" Faced rigid cellular polyiso insulation | **17,333** | SF | $4.00 | $69,332 |
| 204 | Fluid applied air vapor barrier | **17,333** | SF | $5.50 | $95,332 |
| 205 | Exterior CMU wall; scored ground face CMU, 8x12x16 , 4x8x16, and "utility" 4x12x4 | **24,140** | SF | $36.00 | $869,040 |
| 206 | 3" Faced rigid cellular polyiso insulation | **24,140** | SF | $4.00 | $96,560 |
| 207 | Fluid applied air vapor barrier | **24,140** | SF | $5.50 | $132,770 |
| 208 | ½" Fiberglass faced gypsum sheathing | **26,668** | SF | $2.00 | $53,336 |
| 209 | 10" Cold formed metal framing | **26,668** | SF | $12.00 | $320,016 |
| 210 | ⅝" GWB interior of exterior wall | **26,668** | SF | $2.50 | $66,670 |
| 211 | 12" Reinforced ground face CMU wall backup @ Auditorium & Gym | **14,805** | SF | $28.00 | $414,540 |
| 212 | Caulking and sealants at brick & CMU | **41,473** | SF | $0.65 | $26,957 |
| 213 | 4" Utility brick, both sides @ parapet wall, Main Entrance | **175** | SF | $32.00 | $5,600 |
| 214 | Precast colored coping on top of parapet wall | **26** | LF | $150.00 | $3,900 |
| 215 | Premium for custom brick and CMU @ lintels & shelves | **1,128** | LF | $50.00 | $56,400 |
| 216 | Corrugated metal panel w/exposed fasteners | **4,578** | SF | $60.00 | $274,680 |
| 217 | 5" Fiberglass thermal Z-furring | **4,578** | SF | $3.50 | $16,023 |
| 218 | 4" Mineral fiber insulation | **4,578** | SF | $4.50 | $20,601 |
| 219 | Fluid applied air vapor barrier | **4,578** | SF | $5.50 | $25,179 |
| 220 | ½" Fiberglass faced gypsum sheathing | **4,578** | SF | $2.00 | $9,156 |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 221 | 10" Cold formed metal framing | **4,578** | SF | $12.00 | $54,936 |
| 222 | ⅝" GWB interior of exterior wall | **4,578** | SF | $2.50 | $11,445 |
| 223 | Caulking and sealants at corrugated metal panel | **4,578** | SF | $0.65 | $2,976 |
| 224 | Composite metal panel w/exposed fasteners | **3,638** | SF | $75.00 | $272,850 |
| 225 | 5" Fiberglass thermal Z-furring | **3,638** | SF | $3.50 | $12,733 |
| 226 | 4" Mineral fiber insulation | **3,638** | SF | $4.50 | $16,371 |
| 227 | Fluid applied air vapor barrier | **3,638** | SF | $5.50 | $20,009 |
| 228 | ½" Fiberglass faced gypsum sheathing | **3,638** | SF | $2.00 | $7,276 |
| 229 | 10" Cold formed metal framing | **3,638** | SF | $12.00 | $43,656 |
| 230 | ⅝" GWB interior of exterior wall | **3,638** | SF | $2.50 | $9,095 |
| 231 | Caulking and sealants at composite metal panel | **3,638** | SF | $0.65 | $2,365 |
| 232 | Wood grain phenolic panel - Trespa @ ext wall incl's projections/window bay | **6,581** | SF | $82.00 | $539,642 |
| 233 | 5" Fiberglass thermal Z-furring | **6,581** | SF | $3.50 | $23,034 |
| 234 | 4" Mineral fiber insulation at Trespa cladding - | **6,581** | SF | $4.50 | $29,615 |
| 235 | Fluid applied air vapor barrier | **6,581** | SF | $5.50 | $36,196 |
| 236 | ½" Fiberglass faced gypsum sheathing | **6,581** | SF | $2.00 | $13,162 |
| 237 | 10" Cold formed metal framing | **6,581** | SF | $12.00 | $78,972 |
| 238 | ⅝" GWB interior of exterior wall | **6,581** | SF | $2.50 | $16,453 |
| 239 | Caulking and sealants at Trespa cladding | **6,581** | SF | $0.65 | $4,278 |
| 240 | | | | | |
| 241 | Phenolic panel; Ext soffit at projection/window bay | **1,250** | SF | $82.00 | $102,500 |
| 242 | Furring | **1,250** | SF | $4.25 | $5,313 |
| 243 | 4" mineral fiber insulation at Trespa cladding - Exterior soffit | **1,250** | SF | $4.00 | $5,000 |
| 244 | Air vapor barrier at Trespa cladding - Exterior soffit | **1,250** | SF | $5.50 | $6,875 |
| 245 | 1/2" sheathing at Trespa cladding - Exterior soffit | **1,250** | SF | $2.00 | $2,500 |
| 246 | 6" Metal stud at Trespa cladding - Exterior soffit | **1,250** | SF | $9.50 | $11,875 |
| 247 | 5/8 GWB at Trespa cladding - Exterior soffit | **1,250** | SF | $2.50 | $3,125 |
| 248 | Caulking and sealants at Trespa cladding - Ext. soffit | **1,250** | SF | $0.65 | $813 |
| 249 | | | | | |
| 250 | *Miscellaneous* | | | | |
| 251 | Sand blasted cast in place concrete walls | **1** | LS | $50,000.00 | $50,000 |
| 252 | Precast concrete at planter w/galv steel connection & cross bracing | **212** | SF | $75.00 | $15,900 |
| 253 | Precast planter | **50** | LF | $750.00 | $37,500 |
| 254 | Cont galv relieving angle at masonry wall | **1,038** | LF | $100.00 | $103,800 |
| 255 | Loose lintel @ exterior wall openings | **90** | LF | $200.00 | $18,000 |
| 256 | Miscellaneous metals in exterior closure | **57,520** | SF | $1.50 | $86,280 |
| 257 | Window caulking | | | | Div B2020 |
| 258 | Through wall sheet metal flashing | **1,424** | LF | $25.00 | $35,600 |
| 259 | Corrugated perforated metal; mechanical RTU screen | **1,678** | SF | $60.00 | $100,680 |
| 260 | Metal louver | **625** | SF | $85.00 | $53,125 |
| 261 | Exterior mockup | **1** | LS | $50,000.00 | $50,000 |
| 262 | Temporary enclosures | **1** | LS | $50,000.00 | $50,000 |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 263 | **B2010 EXTERIOR WALLS TOTAL** | | | | **$5,096,693** |
| 264 | | | | | |
| 265 | **B2020 EXTERIOR WINDOWS** | ***12,630*** | *SF* | | |
| 266 | *Aluminum storefronts, double glazed w/security insul glazing, school guard glass, laminated interior glass* | *919* | *SF* | | |
| 267 | Type 10A; 24'-8 1/4" x 12'-0" | **1** | EA | $34,300.00 | $34,300 |
| 268 | Type 11A; 9'-6 1/4" x 12'-0" | **1** | EA | $13,200.00 | $13,200 |
| 269 | Type 12A; 9'-7 1/2" x 12'-0" | **2** | EA | $11,600.00 | $23,200 |
| 270 | Type 13A; 7'-6" x 12'-0" | **1** | EA | $10,400.00 | $10,400 |
| 271 | Type 16A; 12'-0" x 13'-0 1/2" | **1** | EA | $17,900.00 | $17,900 |
| 272 | *Bay windows* | *2,912* | *SF* | | |
| 273 | Type 1; 9'-3" x 12'-0" | **10** | EA | $13,300.00 | $133,000 |
| 274 | Type 2; 9'-3" x 12'-0" | **11** | EA | $13,300.00 | $146,300 |
| 275 | Type 2A; 9'-3" x 11'-0 1/4" | **2** | EA | $12,700.00 | $25,400 |
| 276 | Type 3; 9'-3" x 11'-6" | **9** | EA | $12,700.00 | $114,300 |
| 277 | Type 3C; 7'-0" x 12'-0" | **1** | EA | $10,100.00 | $10,100 |
| 278 | *Curtain wall/Windows* | *8,799* | *SF* | | |
| 279 | Type 4; 3'-0" x 10'-1" | **57** | EA | $3,500.00 | $199,500 |
| 280 | Type 5A; 3'-11" x 12'-0" | **6** | EA | $5,800.00 | $34,800 |
| 281 | Type 5B; 3'-11" x 11'-6" | **22** | EA | $5,800.00 | $127,600 |
| 282 | Type A1; 1'-4" x 3'-0" | **1** | EA | $500.00 | $500 |
| 283 | Type A2; 2'-0" x 4'-0" | **1** | EA | $1,000.00 | $1,000 |
| 284 | Type A3; 2'-0" x 12'-0" | **27** | EA | $2,600.00 | $70,200 |
| 285 | Type B1; 3'-4" x 12'-0" | **10** | EA | $4,400.00 | $44,000 |
| 286 | Type B1A; 3'-4" x 5'-10" | **2** | EA | $1,800.00 | $3,600 |
| 287 | Type B3; 3'-4" x 7'-0" | **1** | EA | $2,800.00 | $2,800 |
| 288 | Type B4; 3'-4" x 12'-0" | **9** | EA | $4,400.00 | $39,600 |
| 289 | Type C1; 3'-4" x 12'-0" | **14** | EA | $4,400.00 | $61,600 |
| 290 | Type D1; 5'-4" x 6'-2" | **2** | EA | $3,900.00 | $7,800 |
| 291 | Type D3; 5'-4" x 12'-0" | **12** | EA | $7,000.00 | $84,000 |
| 292 | Type E1; 5'-4" x 10'-0" | **3** | EA | $7,000.00 | $21,000 |
| 293 | Type E2; 5'-4" x 12'-0" | **6** | EA | $7,000.00 | $42,000 |
| 294 | Type F1; 7'-4" x 6'-2" | **1** | EA | $5,400.00 | $5,400 |
| 295 | Type F2; 7'-4" x 10'-0" | **3** | EA | $9,200.00 | $27,600 |
| 296 | Type F3; 7'-4" x 12'-0" | **7** | EA | $9,600.00 | $67,200 |
| 297 | Type G1; 7'-4" x 12'-0" | **11** | EA | $9,600.00 | $105,600 |
| 298 | Type H1; 9'-4" x 6'-0" | **1** | EA | $7,000.00 | $7,000 |
| 299 | Type H2; 9'-4" x 10'-0" | **1** | EA | $12,200.00 | $12,200 |
| 300 | Type H3; 9'-4" x 12'-0" | **1** | EA | $14,000.00 | $14,000 |
| 301 | Type I1; 9'-4" x 6'-0" | **1** | EA | $7,000.00 | $7,000 |
| 302 | Type I2; 9'-4" x 10'-0" | **1** | EA | $12,200.00 | $12,200 |
| 303 | Type I3; 9'-4" x 12'-0" | **1** | EA | $12,200.00 | $12,200 |
| 304 | Type K1; 11'-4" x 12'-0" | **2** | EA | $17,000.00 | $34,000 |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | | TOTAL |
|---|---|---|---|---|---|---|
| 305 | Type L1; 13'-4" x 12'-0" | 1 | EA | $17,500.00 | | $17,500 |
| 306 | Type M1; 10'-4" x 6'-2" | 1 | EA | $8,000.00 | | $8,000 |
| 307 | Type N1; 6'-4" x 4'-4" | 2 | EA | $3,400.00 | | $6,800 |
| 308 | Type N2; 6'-4" x 5'-10" | 2 | EA | $4,400.00 | | $8,800 |
| 309 | Type O1; 6'-4" x 12'-0" | 2 | EA | $9,500.00 | | $19,000 |
| 310 | Type Q1; 4'-4" x 7'-0" | 1 | EA | $3,600.00 | | $3,600 |
| 311 | Type R1; 3'-4" x 6'-11" irregular shape | 1 | EA | $2,900.00 | | $2,900 |
| 312 | Horizontal aluminum sun shades attached to CW/windows @ south elevation; allow | 1,755 | LF | $175.00 | NIC | |
| 313 | Blocking for openings | 7,906 | LF | $8.00 | | $63,248 |
| 314 | Window caulking | 7,906 | LF | $3.00 | | $23,718 |
| 315 | Add premium cost for translucent | 360 | SF | $25.00 | | $9,000 |
| 316 | Allow for premium cost for security glazing | 614 | SF | $375.00 | | $230,250 |
| 317 | **B2020 EXTERIOR WINDOWS TOTAL** | | | | | **$1,965,316** |
| 318 | | | | | | |
| 319 | **B2030 EXTERIOR DOORS** | | | | | |
| 320 | OH door, 12'-0" x 10'-6" motor operated @ Makerspace | 1 | EA | $8,000.00 | | $8,000 |
| 321 | *Exterior HM doors; complete* | *45* | *LEAF* | | | |
| 322 | Type A, single | 1 | LEAF | $1,800.00 | | $1,800 |
| 323 | Type B1, single | 5 | LEAF | $1,800.00 | | $9,000 |
| 324 | Type B2, pair | 9 | PR | $3,600.00 | | $32,400 |
| 325 | Type B2, 10'-0" x 8'-6" @ Receiving | 1 | PR | $5,000.00 | | $5,000 |
| 326 | *Aluminum entry doors including hardware* | *17* | *LEAF* | | | |
| 327 | Type SF1, single | 7 | LEAF | $3,500.00 | | $24,500 |
| 328 | Type SF2, pair | 5 | PR | $7,000.00 | | $35,000 |
| 329 | School guard premium | 5 | LVS | $10,000.00 | | $50,000 |
| 330 | Card reader | 3 | EA | $3,500.00 | | $10,500 |
| 331 | RDL; Remote door un/lock | 16 | EA | $3,500.00 | | $56,000 |
| 332 | **B2030 EXTERIOR DOORS TOTAL** | | | | | **$232,200** |
| 333 | | | | | | |
| 334 | ***TOTAL SYSTEM B20 EXTERIOR CLOSURE*** | | | | | **$7,294,209** |
| 335 | | | | | | |
| 336 | | | | | | |
| 337 | ***B30 ROOFING*** | | | | | |
| 338 | | | | | | |
| 339 | **B3010 ROOF COVERINGS** | | | | | |
| 340 | | | | | | |
| 341 | *Roofing* | | | | | |
| 342 | Rough carpentry/wood blocking to roof | 5,138 | LF | $13.50 | | $69,363 |
| 343 | *Single-ply PVC membrane roofing system* | *65,518* | *SF* | | | |
| 344 | Type 1; Main roof, lower roof | 36,386 | SF | $13.50 | | $491,211 |
| 345 | Type 2; Gym | 8,955 | SF | $13.50 | | $120,893 |
| 346 | Type 3; Raised roof above Learning Commons | 8,610 | SF | $13.50 | | $116,235 |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 347 | Type 4; Entry walkway & Terrace | **1,216** | SF | $13.50 | $16,409 |
| 348 | Type 5; Auditorium | **7,615** | SF | $13.50 | $102,803 |
| 349 | Vertical roof membrane, 5'-6" h at raised roof | **2,736** | SF | $14.50 | $39,672 |
| 350 | ½" roof cover board | **65,518** | SF | $2.25 | $147,414 |
| 351 | 6" insulation | **65,518** | SF | $2.50 | $163,794 |
| 352 | Vapor retarder | **65,518** | SF | $1.50 | $98,276 |
| 353 | Add ½"fire rated roof board @ Auditorium, Gym & raised roof area over Learning Commons | **17,565** | SF | $2.75 | $48,304 |
| 354 | Add 2 layers ½"fiber cement roof board @ Auditorium | **7,615** | SF | $5.00 | $38,075 |
| 355 | Add acoustic insulation in flutes @ Auditorium & Gym roof de | **16,570** | SF | $1.50 | $24,855 |
| 356 | Precast concrete pavers over adjustable deck pedestal system @ roof type 4 | **1,216** | SF | $45.00 | $54,698 |
| 357 | Polycarbonate entrance canopy | **420** | SF | $185.00 | $77,700 |
| 358 | Prefinished aluminum fascia/roof edge | **3,054** | LF | $65.00 | $198,510 |
| 359 | Roof expansion joint | **1** | AL | $25,000.00 | $25,000 |
| 360 | | | | | |
| 361 | *Roofing Accessories* | | | | |
| 362 | Miscellaneous roof accessories | **1** | LS | $22,000.00 | $22,000 |
| 363 | Roof hatch | **2** | EA | $3,000.00 | $6,000 |
| 364 | Paver walkway | **745** | SF | $25.00 | $18,625 |
| 365 | | | | | |
| 366 | *Roof openings* | | | | |
| 367 | Glazed aluminum-framed skylight | **4,015** | SF | $175.00 | $702,625 |
| 368 | **B3010 ROOF COVERINGS TOTAL** | | | | **$2,582,461** |
| 369 | | | | | |
| 370 | ***TOTAL SYSTEM B30 ROOFING*** | | | | **$2,582,461** |
| 371 | | | | | |
| 372 | | | | | |
| 373 | ***C10 INTERIOR CONSTRUCTION*** | | | | |
| 374 | | | | | |
| 375 | **C1010 PARTITIONS** | | | | |
| 376 | *04 00 00 Masonry* | | | | |
| 377 | 12" CMU wall reinforced; Gym & Auditorium, double hgt | **7,942** | SF | $32.00 | $254,144 |
| 378 | 8" CMU wall, load bearing wall @ Auditorium | **1,284** | SF | $24.00 | $30,816 |
| 379 | Stairs/elevator CMU wall | **3,266** | SF | $24.00 | $78,384 |
| 380 | | | | | |
| 381 | *Gypsum board partitions* | *114,616* | *SF* | | |
| 382 | Type B3; 3 5/8" metal stud, 5/8" GWB | **203** | SF | $7.20 | $1,462 |
| 383 | Type B4; same as type B3, add batt insulation | **5,145** | SF | $8.70 | $44,762 |
| 384 | Type C2; 3 5/8" metal stud, 2x 5/8" GWB | **5,600** | SF | $9.40 | $52,640 |
| 385 | Type C3; 3 5/8" metal stud, 2x 5/8" GWB, batt insulation | **6,483** | SF | $10.90 | $70,665 |
| 386 | Type C4; same as type C3, add 1hr fire rated | **3,165** | SF | $11.40 | $36,081 |

# Fuller Middle School

Framingham, MA
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## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 387 | Type C6; 6" metal stud, 2x 5/8" GWB, batt insulation | **2,468** | SF | $12.90 | $31,837 |
| 388 | Type C7; same as type C6, add 1hr fire rated | **5,507** | SF | $13.40 | $73,794 |
| 389 | Type C8; 8" metal stud, 2x 5/8" GWB, batt insulation | **172** | SF | $14.90 | $2,563 |
| 390 | Type C10; 10" metal stud, 2x 5/8" GWB, batt insulation | **222** | SF | $16.90 | $3,752 |
| 391 | Type D3; 3 5/8" metal stud, 2x 5/8" GWB, batt insulation | **1,526** | SF | $10.90 | $16,633 |
| 392 | Type D6; 6" metal stud, 2x 5/8" GWB, batt insulation | **1,266** | SF | $12.90 | $16,331 |
| 393 | Type E3; 3 5/8" metal stud, 3x 5/8" GWB, batt insulation | **23,327** | SF | $13.10 | $305,584 |
| 394 | Type E4; same as type E3, add 1hr fire rated | **780** | SF | $13.60 | $10,608 |
| 395 | Type E6; 6" metal stud, 3x 5/8" GWB, batt insulation | **1,158** | SF | $15.30 | $17,717 |
| 396 | Type E7; 10" metal stud, 3x 5/8" GWB, batt insulation | **1,022** | SF | $19.30 | $19,725 |
| 397 | Type E8; 8" metal stud, 3x 5/8" GWB, batt insulation | **18,060** | SF | $17.30 | $312,438 |
| 398 | Type E9; same as type E8, add 1hr fire rated | **2,710** | SF | $17.80 | $48,238 |
| 399 | Type F1; 3 5/8" metal stud, 4x 5/8" GWB, batt insulation | **4,988** | SF | $15.30 | $76,316 |
| 400 | Type F2; same as type F1, add 1hr fire rated | **1,834** | SF | $15.80 | $28,977 |
| 401 | Type F6; 6" metal stud, 4x 5/8" GWB, batt insulation | **9,646** | SF | $17.30 | $166,876 |
| 402 | Type F7; 8" metal stud, 4x 5/8" GWB, batt insulation | **227** | SF | $19.30 | $4,381 |
| 403 | Type F8; same as type F7, add 1hr fire rated | **1,065** | SF | $19.80 | $21,087 |
| 404 | Type H4; 4" metal C-H stud, 3x 5/8" GWB, batt insulation, 2hr rated | **67** | SF | $15.10 | $1,012 |
| 405 | Type H6; 6" metal C-H stud, 3x 5/8" GWB, batt insulation, 2hr rated @ Elevator | **1,561** | SF | $17.10 | $26,693 |
| 406 | Type J1; 2 x (3 5/8" metal stud, 5/8" GWB, batt insulation) | **6,552** | SF | $17.40 | $114,005 |
| 407 | Type J2; same as type J1 | **1,157** | SF | $17.40 | $20,132 |
| 408 | Type K1; 2 x (3 5/8" metal stud, 2x5/8" GWB, batt insulation) | **6,245** | SF | $21.80 | $136,141 |
| 409 | Type K2; same as typeK1, add 1hr fire rated | **2,460** | SF | $22.30 | $54,858 |
| 410 | High Impact GWB premium | **51,577** | SF | $1.00 | $51,577 |
| 411 | Rough carpentry internal partitions and ceilings | **137,385** | GSF | $1.25 | $171,731 |
| 412 | Misc metals for interior construction | **137,385** | GSF | $1.25 | $171,731 |
| 413 | | | | | |
| 414 | *Operable partition* | | | | |
| 415 | Operable partitions | **5,440** | SF | $90.00 | $489,600 |
| 416 | Operable partition framing support beam | **633** | LF | $175.00 | $110,775 |
| 417 | | | | | |
| 418 | *Interior windows* | | | | |
| 419 | Interior | **5,215** | SF | $55.00 | $286,825 |
| 420 | Glazed film | **4,332** | SF | $60.00 | $259,920 |
| 421 | Ballistic glass sliding window @ Admin | **1** | EA | $2,500.00 | $2,500 |
| 422 | Mirror frameless | **1,454** | SF | $45.00 | $65,430 |
| 423 | Graduated glass;  premium | **2,359** | SF | $65.00 | $153,335 |
| 424 | Acoustical glass premium | **505** | SF | $300.00 | $151,500 |
| 425 | *Interior storefront* | | | | |
| 426 | Storefront @ vestibule | **3,115** | SF | $85.00 | $264,775 |
| 427 | Breakout Space-A, B & C; Glazed partition/wood panel closure | **3** | EA | $125,000.00 | $375,000 |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 428 | *Interior penetration firestopping* | | | | |
| 429 | Interior caulking | **137,385** | GSF | $0.50 | BP#2 |
| 430 | Top-of-partition firestopping | **137,385** | GSF | $1.00 | $137,385 |
| 431 | **C1010 PARTITIONS TOTAL** | | | | **$4,770,736** |
| 432 | | | | | |
| 433 | **C1020 INTERIOR DOORS, FRAMES & HARDWARE** | | | | |
| 434 | *08 10 00 Hollow Metal Doors and Frames:* | | | | |
| 435 | Security gate 7'-0" x 7'-10", steel @ 1st Floor Corridors | **2** | EA | $975.00 | $1,950 |
| 436 | *Hollow Metal Doors:* | | | | |
| 437 | type B1, single | **41** | EA | $325.00 | $13,325 |
| 438 | type B2, pair | **6** | EA | $650.00 | $3,900 |
| 439 | HM frames | **260** | EA | $225.00 | $58,500 |
| 440 | HM frames for pair doors | **29** | EA | $275.00 | $7,975 |
| 441 | *Wood Doors:* | | | | |
| 442 | type B1, single, wood | **91** | EA | $325.00 | $29,575 |
| 443 | same as above w/applied surface both sides | **13** | EA | $775.00 | $10,075 |
| 444 | type B1, 5'-0" x 26'-0" swinging panel @ AV rooms | **2** | EA | $25,000.00 | $50,000 |
| 445 | type B2, pair, wood | **13** | EA | $650.00 | $8,450 |
| 446 | type C1, single, wood w/full height glass | **111** | EA | $400.00 | $44,400 |
| 447 | type C2, pair, w/full height glass | **9** | EA | $800.00 | $7,200 |
| 448 | type C3, pair, w/vision panel 0'-5" x 6'-0" | **1** | EA | $800.00 | $800 |
| 449 | Premium cost for acoustical doors | **40** | LOC | $250.00 | $10,000 |
| 450 | | | | | |
| 451 | *Coiling drapery, security screen* | | | | |
| 452 | Cafeteria/Learning Commons; 21'-0" x 8'-0" (2 ea) | **336** | SF | $55.00 | $18,480 |
| 453 | Kitchen; 40'-0" x 8'-0" (1 ea) | **320** | SF | $55.00 | $17,600 |
| 454 | Admin area; 21'-0" x 5'-6" (1 ea) | **116** | SF | $55.00 | $6,353 |
| 455 | | | | | |
| 456 | *Aluminum-Framed Entrances and Storefronts, interior* | | | | |
| 457 | type SF1, single, aluminum/glass | **3** | EA | $2,500.00 | $7,500 |
| 458 | type SF2, pair, aluminum/glass | **2** | PR | $5,000.00 | $10,000 |
| 459 | School guard doors, premium | **5** | LVS | $10,000.00 | $50,000 |
| 460 | | | | | |
| 461 | *Access Doors and Frames* | | | | |
| 462 | Access doors | **100** | EA | $300.00 | $30,000 |
| 463 | | | | | |
| 464 | Door sidelights | **900** | SF | $55.00 | $49,500 |
| 465 | Glazing to doors | **1,554** | SF | $55.00 | $85,470 |
| 466 | | | | | |
| 467 | Hardware | **318** | SET | $750.00 | $238,500 |
| 468 | Powered door openers | **4** | LOC | $3,500.00 | $14,000 |
| 469 | CR; Card reader | **15** | EA | $3,000.00 | $45,000 |
| 470 | RDL; Remote door un/lock | **14** | EA | $3,000.00 | $42,000 |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 471 | Paint door frames | **318** | EA | $85.00 | $27,030 |
| 472 | Paint door | **318** | EA | $65.00 | $20,670 |
| 473 | | | | | |
| 474 | Blocking at doors | **5,406** | LF | $2.50 | $13,515 |
| 475 | Door Installation | **318** | EA | $150.00 | $47,700 |
| 476 | **C1020 INTERIOR DOORS, FRAMES & HARDWARE TOTAL** | | | | **$969,468** |
| 477 | | | | | |
| 478 | **C1030 FITTINGS** | | | | |
| 479 | Miscellaneous metals for fittings | **137,385** | GSF | $1.25 | $171,731 |
| 480 | | | | | |
| 481 | Tackboards | **2,688** | SF | $18.00 | $48,384 |
| 482 | Markerboards | **5,376** | SF | $25.00 | $134,400 |
| 483 | Tackable wall; allow | **3,000** | SF | $18.00 | $54,000 |
| 484 | | | | | |
| 485 | Window stools - Solid surfacing material | **1,250** | LF | $50.00 | $62,500 |
| 486 | Toilets | | | | |
| 487 | Vanity counter; Toilets | **319** | LF | $200.00 | $63,800 |
| 488 | Vanity counter; Dressing | **33** | LF | $200.00 | $6,600 |
| 489 | Folding panel shutter w/w/magnetic writable surfice both sides | **40** | EA | $1,000.00 | $40,000 |
| 490 | | | | | |
| 491 | *Signage* | | | | |
| 492 | Commerative plaque | **2** | LOC | $1,500.00 | $3,000 |
| 493 | Dimensional characters; School name | **1** | AL | $5,000.00 | $5,000 |
| 494 | Plastic panel signs for room idenfication, way finding, hazard identification | **1** | AL | $7,500.00 | $7,500 |
| 495 | Framed paper signs | **1** | AL | $2,180.00 | $2,180 |
| 496 | Miscellaneous signage | **137,385** | GSF | $0.50 | $68,693 |
| 497 | | | | | |
| 498 | *Wall & corner guards* | | | | |
| 499 | Stainless steel corner guards | **1** | LS | $10,000.00 | $10,000 |
| 500 | | | | | |
| 501 | *Toilet compartments (plastic laminate)* | | | | |
| 502 | Toilet compartments | **20** | EA | $1,200.00 | $24,000 |
| 503 | Toilet compartments - ADA | **14** | EA | $1,400.00 | $19,600 |
| 504 | *Urinal screen* | **20** | EA | $800.00 | $16,000 |
| 505 | | | | | |
| 506 | *Lockers* | | | | |
| 507 | Athletic / PE lockers: metal 2-tier 30”h. x 15”w x 15”d | **50** | EA | $250.00 | $12,500 |
| 508 | Kitchen staff lockers, single tier, 12" x 12" x 6' high | **6** | EA | $250.00 | $1,500 |
| 509 | Student lockers 15"x12"x36" w/angled top, phenolic w/plam finish and wd veneer sides and back | **660** | EA | $385.00 | $254,100 |
| 510 | Angles at lockers | **825** | LF | $35.00 | $28,875 |
| 511 | *Toilet accessories* | | | | |

# Fuller Middle School

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## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 512 | Combination PTD/WR unit | 8 | EA | $150.00 | $1,200 |
| 513 | Towel dispenser/waste receptacle | 45 | EA | $100.00 | $4,500 |
| 514 | Soap dispensers | 45 | EA | $35.00 | $1,575 |
| 515 | Toilet paper dispensers | 48 | EA | $65.00 | $3,120 |
| 516 | Sanitary napkin disposal units | 21 | EA | $250.00 | $5,250 |
| 517 | Robe hook | 15 | EA | $25.00 | $375 |
| 518 | Fold-down shower seat | 1 | EA | $200.00 | $200 |
| 519 | Grab bars | 28 | PR | $160.00 | $4,480 |
| 520 | Mirrors - in private bathrooms | 14 | EA | $150.00 | $2,100 |
| 521 | Mop holder w/shelf (Janitors) | 6 | EA | $180.00 | $1,080 |
| 522 | | | | | |
| 523 | *Fire extinguisher cabinets* | | | | |
| 524 | Fully recessed/non-rated | 14 | EA | $450.00 | $6,182 |
| 525 | Semi-recessed/non-rated | 6 | EA | $300.00 | $1,800 |
| 526 | | | | | |
| 527 | *Other fittings* | | | | |
| 528 | Wood cantelevered benches at classroom glazed partitions | 42 | EA | $350.00 | $14,700 |
| 529 | Curtain track, carriers and curtains | 2 | EA | $200.00 | $400 |
| 530 | **C1030 FITTINGS TOTAL** | | | | **$1,081,325** |
| 531 | | | | | |
| 532 | ***TOTAL SYSTEM C10 INTERIOR CONSTRUCTION*** | | | | **$6,821,528** |
| 533 | | | | | |
| 534 | | | | | |
| 535 | ***C20 STAIRCASES*** | | | | |
| 536 | | | | | |
| 537 | **C2010 STAIRCASES** | | | | |
| 538 | *Interior stairs* | | | | |
| 539 | Egress stairs | 6 | FLT | $25,000.00 | $150,000 |
| 540 | Monumental/open stairs #4 & #5 | | | | BP#2 |
| 541 | Monumental/open stairs #3 | 1 | FLT | $65,000.00 | $65,000 |
| 542 | | | | | |
| 543 | *Stair finishes* | | | | |
| 544 | Railings | 1 | LS | $150,000.00 | $150,000 |
| 545 | Linoleum treads & risers with rubber nosing | 828 | LFR | $15.50 | $12,834 |
| 546 | Linoleum tile at landings | 1,717 | SF | $8.00 | $13,736 |
| 547 | Monumental/open stairs | 920 | LFR | $85.00 | $78,200 |
| 548 | **C2010 STAIRCASES TOTAL** | | | | **$469,770** |
| 549 | | | | | |
| 550 | ***TOTAL C20 STAIRCASES*** | | | | **$469,770** |
| 551 | | | | | |
| 552 | | | | | |
| 553 | ***C30 INTERIOR FINISHES*** | | | | |
| 554 | | | | | |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 555 | **C3010 WALL FINISHES** | | | | |
| 556 | *Auditorium walls:* | | | | |
| 557 | Plam wall panel to auditorium | **2,900** | SF | $42.00 | $121,800 |
| 558 | FRP; fiber reinforced panels in Kitchen | **1,921** | SF | $15.00 | $28,815 |
| 559 | Epoxy paint wainscot @ Locker/Toilet | **8,234** | SF | $2.00 | $16,468 |
| 560 | Solid epoxy backsplash | **650** | SF | $18.00 | $11,700 |
| 561 | Linoleum base | **12,630** | LF | $7.00 | $88,410 |
| 562 | Metal trim detail | **12,630** | LF | $8.00 | $101,040 |
| 563 | Vented rubber wall base | **375** | LF | $3.00 | $1,125 |
| 564 | Metal trim detail | **375** | LF | $5.00 | $1,875 |
| 565 | Exposed column covers; allowance | **1** | LS | $35,000.00 | $35,000 |
| 566 | P.lam panel wall cover | **330** | SF | $25.00 | $8,250 |
| 567 | *Academic areas:* | | | | |
| 568 | Magnetic writing surface | **6,400** | SF | $25.00 | $160,000 |
| 569 | Plam bumper w/HD wood marker tray | **2,915** | LF | $90.00 | $262,350 |
| 570 | Maple rail | **1,600** | LF | $30.00 | $48,000 |
| 571 | over curved gwb partition at curved wall | **3,156** | SF | $27.50 | $86,790 |
| 572 | Fabric wrapped acoustic wall panels @ Music areas | **1,443** | SF | $22.00 | $31,746 |
| 573 | sloped fabric wrapped acoustic panel | **8,359** | SF | $24.50 | $204,796 |
| 574 | Cementitious wood fiber acoustical wall panel @ Gym | **6,255** | SF | $15.00 | $93,825 |
| 575 | Mural panorama wall cover; angeled @ Media, Admin Install | **1,575** | SF | $1.50 | $2,363 |
| 576 | Wall pads with cutout for MEH units; allow | **1** | AL | $1,500.00 | $1,500 |
| 577 | Cafeteria fixed sound absorbing panel, wood fiber; allow | **2,000** | SF | $25.00 | $50,000 |
| 578 | Wall panels at auditorium | **1,500** | SF | $85.00 | $127,500 |
| 579 | Wall epoxy | **1,100** | SF | $18.00 | $19,800 |
| 580 | Paint CMU wall | **12,492** | SF | $1.10 | $13,741 |
| 581 | Paint drywall partitions | **273,034** | SF | $0.95 | $259,382 |
| 582 | **C3010 WALL FINISHES TOTAL** | | | | **$1,776,276** |
| 583 | | | | | |
| 584 | **C3020 FLOOR FINISHES** | *124,516* | *SF* | | |
| 585 | EP; epoxy flooring at Toilets | **7,940** | SF | $15.00 | $119,100 |
| 586 | Quarry tile at Kitchen | **1,705** | SF | $25.00 | $42,625 |
| 587 | | | | | |
| 588 | *Flooring* | | | | |
| 589 | Acoustic underlayment under resilient flooring | **52,962** | SF | $2.75 | $145,646 |
| 590 | LT; Linoleum tile flooring, 13" x 13" | **93,064** | SF | $7.00 | $651,448 |
| 591 | LP; Plank linoleum flooring | **1,100** | SF | $10.00 | $11,000 |
| 592 | Wood athletic flooring at Gym | **8,405** | SF | $25.00 | $210,125 |
| 593 | Stage wood flooring: 4" hardboard assembly- recessed: | **1,590** | SF | $30.50 | $48,495 |
| 594 | 1/4" double tempered smooth both sides hardboard | | | | |
| 595 | (2) layers 3/4" plywood on sleepers with insulation | | | | |
| 596 | *Auditorium:* | | | | |
| 597 | slab on grade power troweled concrete at seats | **2,240** | SF | $9.00 | $20,160 |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 598 | carpet at aisles | **2,770** | SF | $12.00 | $33,240 |
| 599 | PC; power troweled concrete @ Makerspace, Auditorium, AV | **2,018** | SF | $9.00 | BP#2 |
| 600 | *Painting* | | | | |
| 601 | SC; sealed concrete at back of house | **3,288** | SF | $1.75 | $5,754 |
| 602 | *Entrance mats* | | | | |
| 603 | RG; Vestibule | **396** | SF | $35.00 | $13,860 |
| 604 | **C3020 FLOOR FINISHES TOTAL** | | | | **$1,301,453** |
| 605 | | | | | |
| 606 | **C3030 CEILING FINISHES** | *116,094* | *SF* | | |
| 607 | ACT ceilings at Corridors, Public, Admin areas, Teacher Pl | **50,004** | SF | $5.00 | $250,020 |
| 608 | ACT ceiling, washable in kitchen | **1,705** | SF | $5.25 | $8,951 |
| 609 | *Academic areas: classrooms, science, media, art, music, etc* | | | | |
| 610 | E1; Exposed deck, painted @ Classrooms | **24,380** | SF | $1.50 | $36,570 |
| 611 | Circulation Corridors ceiling | **13,581** | SF | $32.00 | $434,592 |
| 612 | GWB soffit, light cove | **1,320** | LF | $35.00 | $46,200 |
| 613 | GWB ceiling/soffit in classrooms | **16,127** | SF | $32.00 | $516,064 |
| 614 | A1; ACT - MR ceiling at Toilets | **6,869** | SF | $5.75 | $39,498 |
| 615 | Sloped GWB soffit @ Art. | **175** | SF | $18.00 | $3,150 |
| 616 | Lay in ACT ceiling at band/chorus | **4,550** | SF | $5.00 | $22,750 |
| 617 | Auditorium ceiling; painted exposed metal deck | **6,600** | SF | $2.50 | $16,500 |
| 618 | Suspended plam clouds | **4,950** | SF | $55.00 | $272,250 |
| 619 | Gym ceiling; suspended lay in pre painted tegular edge tectum plank | **2,101** | SF | $15.00 | $31,519 |
| 620 | B1; GWB ceiling @ Atrium | **6,402** | SF | $15.00 | $96,030 |
| 621 | Gym exposed deck, painted | **8,405** | SF | $2.00 | $16,810 |
| 622 | Paint | **137,385** | GSF | $0.75 | $103,039 |
| 623 | Paint GWB ceilings w/high performance coating at Toilets | **30,893** | SF | $1.10 | $33,983 |
| 624 | **C3030 CEILING FINISHES TOTAL** | | | | **$1,927,926** |
| 625 | | | | | |
| 626 | ***TOTAL SYSTEM C30 INTERIOR FINISHES*** | | | | **$5,005,654** |
| 627 | | | | | |
| 628 | | | | | |
| 629 | ***D10 CONVEYING SYSTEMS*** | | | | |
| 630 | | | | | |
| 631 | **D1010 CONVEYING SYSTEMS** | | | | |
| 632 | Elevators; 3,500#, 4 stops | **1** | EA | $205,000.00 | $205,000 |
| 633 | Elevator pit ladder | **1** | EA | $1,500.00 | $1,500 |
| 634 | Elevator vent | **1** | EA | $1,200.00 | $1,200 |
| 635 | Sill angles | **4** | EA | $175.00 | $700 |
| 636 | Hoist beam | **1** | EA | $5,000.00 | $5,000 |
| 637 | **D1010 CONVEYING SYSTEMS TOTAL** | | | | **$213,400** |
| 638 | | | | | |
| 639 | ***TOTAL SYSTEM D10 CONVEYING SYSTEMS*** | | | | **$213,400** |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 640 | | | | | |
| 641 | | | | | |
| 642 | **D15 MECHANICAL** | | | | |
| 643 | | | | | |
| 644 | **D20 PLUMBING** | | | | |
| 645 | 6" Water Service w/ sub metera | **1** | EA | $9,500.00 | $9,500 |
| 646 | Hot Water Heater & Storage | | | | |
| 647 | - WH-1 | **1** | EA | $65,000.00 | $65,000 |
| 648 | - WH-2 | **1** | EA | $5,500.00 | $5,500 |
| 649 | Mixing Valves | **1** | EA | $2,450.00 | $2,450 |
| 650 | Circulating Pumps | **2** | EA | $1,050.00 | $2,100 |
| 651 | Expansion Tank | **1** | EA | $2,200.00 | $2,200 |
| 652 | 4" Backflow Preventers | **1** | EA | $5,560.00 | $5,560 |
| 653 | Pressure Reducing Station | **1** | EA | $3,650.00 | $3,650 |
| 654 | 1" Backflow Preventers | **2** | EA | $1,850.00 | $3,700 |
| 655 | Grease Interceptor System 8,000 gal | **1** | EA | $48,500.00 | $48,500 |
| 656 | Grease Trap | **1** | EA | $3,850.00 | $3,850 |
| 657 | Oily Water Separator | **1** | EA | $4,580.00 | $4,580 |
| 658 | Acid Neutralization Tank | **2** | EA | By Others | $0 |
| 659 | Condensate Pump: | | | | |
| 660 | - CP-1 5 GPH | **1** | EA | $950.00 | $950 |
| 661 | Heat Tracing | **1** | LS | $5,000.00 | $5,000 |
| 662 | Elevator Sump Pump: | | | | |
| 663 | - SP-1 | **1** | EA | $1,850.00 | $1,850 |
| 664 | Reducer Pressure Backflow Preventer: | | | | |
| 665 | - RBP-1 | **1** | EA | $2,500.00 | $2,500 |
| 666 | Emergency Gas Shut Off Valve | **2** | EA | $1,250.00 | $2,500 |
| 667 | Fixtures | | | | |
| 668 | Water Closet P-1 | **20** | EA | $2,455.00 | $49,100 |
| 669 | Water Closet P-1A | **31** | EA | $2,455.00 | $76,105 |
| 670 | Urinal P-2 | **17** | EA | $2,510.00 | $42,670 |
| 671 | Urinal P-2A | **8** | EA | $2,510.00 | $20,080 |
| 672 | Lavatory P-3 | **49** | EA | $2,365.00 | $115,885 |
| 673 | Lavatory P-3A | **28** | EA | $2,365.00 | $66,220 |
| 674 | Drinking Fountain P-4 | **11** | EA | $3,250.00 | $35,750 |
| 675 | Mop Sink P-5 | **5** | EA | $2,850.00 | $14,250 |
| 676 | Shower P-6 | **2** | EA | $3,850.00 | $7,700 |
| 677 | Science Room Sink P-7 | **40** | EA | $3,650.00 | $146,000 |
| 678 | Science Room Sink P-7A | **2** | EA | $3,650.00 | $7,300 |
| 679 | Classroom Sink P-8 | **7** | EA | $2,565.00 | $17,955 |
| 680 | Art Sink P-9 | **3** | EA | $3,250.00 | $9,750 |
| 681 | Art Sink P-9A | **1** | EA | $3,250.00 | $3,250 |
| 682 | Eyewash/Shower P-10 | **5** | EA | $2,250.00 | $11,250 |

# Fuller Middle School

Framingham, MA
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## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 683 | Fume Hood | 3 | EA | $5,000.00 | $15,000 |
| 684 | Lab Equipment | 1 | LS | $25,000.00 | $25,000 |
| 685 | labs & Consumer Science) | 36 | LS | $385.00 | $13,860 |
| 686 | Floor Clean Outs: | | | | |
| 687 | - FCO-1 | 54 | EA | $725.00 | $39,150 |
| 688 | Floor Drains: | | | | |
| 689 | - 3" FD-A | 14 | EA | $1,050.00 | $14,700 |
| 690 | - 3" FD-B | 8 | EA | $1,065.00 | $8,520 |
| 691 | - 4" FD-B | 5 | EA | $1,165.00 | $5,825 |
| 692 | Trap Primers | 16 | EA | $1,250.00 | $20,000 |
| 693 | Roof Drain: | | | | |
| 694 | - 8 RD-0 | 2 | EA | $1,650.00 | $3,300 |
| 695 | - 6" RD-1 | 12 | EA | $1,410.00 | $16,920 |
| 696 | - 5" RD-2 | 4 | EA | $1,220.00 | $4,880 |
| 697 | - 4" RD-3 | 8 | EA | $1,010.00 | $8,080 |
| 698 | Cup Sinks | 8 | EA | $1,850.00 | $14,800 |
| 699 | Wall Hydrant | | | | |
| 700 | - WHYD-1 | 18 | EA | $375.00 | $6,750 |
| 701 | Hose Bibbs: | | | | |
| 702 | - HB-1 | 12 | EA | $285.00 | $3,420 |
| 703 | VTR | 9 | EA | $650.00 | $5,850 |
| 704 | | | | | |
| 705 | Storm piping, below grade: | | | | |
| 706 | - 12" | 120 | LF | $125.00 | $15,000 |
| 707 | - 8" | 50 | LF | $85.25 | $4,263 |
| 708 | - 6" | 110 | LF | $62.55 | $6,881 |
| 709 | - 4" | 40 | LF | $43.75 | $1,750 |
| 710 | Storm piping, above grade: | | | | |
| 711 | - 10" | 155 | LF | $110.00 | $17,050 |
| 712 | - 8" | 510 | LF | $92.35 | $47,099 |
| 713 | - 6" | 1,010 | LF | $65.05 | $65,701 |
| 714 | - 4" | 165 | LF | $45.10 | $7,442 |
| 715 | Waste and vent piping, below grade: | | | | |
| 716 | - 5" | 650 | LF | $59.61 | $38,747 |
| 717 | - 4" | 560 | LF | $43.75 | $24,500 |
| 718 | - 3" | 265 | LF | $32.25 | $8,546 |
| 719 | - 2" | 110 | LF | $26.85 | $2,954 |
| 720 | Waste and vent piping, above grade: | | | | |
| 721 | - 4" | 685 | LF | $43.10 | $29,524 |
| 722 | - 3" | 785 | LF | $31.55 | $24,767 |
| 723 | - 2" | 850 | LF | $26.25 | $22,313 |
| 724 | Kitchen Waste Beloe grade: | | | | |
| 725 | - 4" | 510 | LF | $32.00 | $16,320 |

# Fuller Middle School

Framingham, MA
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## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 726 | - 3" | **40** | LF | $28.95 | $1,158 |
| 727 | - 2" | **290** | LF | $22.50 | $6,525 |
| 728 | Acid Waste below grade: | | | | |
| 729 | - 4" | **425** | LF | $32.00 | $13,600 |
| 730 | - 2" | **290** | LF | $18.00 | $5,220 |
| 731 | Acid Waste below grade: | | | | |
| 732 | - 4" | **295** | LF | $32.00 | $9,440 |
| 733 | - 3" | **210** | LF | $28.25 | $5,933 |
| 734 | - 2" | **265** | LF | $18.00 | $4,770 |
| 735 | Potable Water Piping: | | | | |
| 736 | - 2-1/2" | **620** | LF | $48.95 | $30,349 |
| 737 | - 2" | **780** | LF | $35.75 | $27,885 |
| 738 | - 1-1/2 | **550** | LF | $30.45 | $16,748 |
| 739 | - 1-1/4 | **475** | LF | $28.35 | $13,466 |
| 740 | - Branch | **8,500** | LF | $25.75 | $218,875 |
| 741 | Insulate Potable Water Piping: | | | | |
| 742 | - 2-1/2" | **620** | LF | $16.40 | $10,168 |
| 743 | - 2" | **780** | LF | $15.65 | $12,207 |
| 744 | - 1-1/2 | **550** | LF | $14.75 | $8,113 |
| 745 | - 1-1/4 | **475** | LF | $14.05 | $6,674 |
| 746 | - Branch | **8,500** | LF | $13.75 | $116,875 |
| 747 | Gas Piping | | | | |
| 748 | - 6" | **50** | LF | $56.25 | $2,813 |
| 749 | - 4" | **80** | LF | $48.95 | $3,916 |
| 750 | - 3" | **120** | LF | $42.25 | $5,070 |
| 751 | - Branch | **980** | LF | $29.65 | $29,057 |
| 752 | Gas Hook-ups | **4** | EA | $850.00 | $3,400 |
| 753 | Master Gas Valves | **2** | EA | $2,850.00 | $5,700 |
| 754 | Pump | **1** | LS | $25,000.00 | $25,000 |
| 755 | Flues to water heater | **120** | LF | $65.00 | $7,800 |
| 756 | Generator Gas Connection | **1** | EA | $5,000.00 | $5,000 |
| 757 | Kitchen | **1** | LS | $50,000.00 | $50,000 |
| 758 | Storm Piping Insulation | **1** | LS | $25,000.00 | $25,000 |
| 759 | Seismic Restraints | **1** | LS | $10,500.00 | $10,500 |
| 760 | Lift & Hoisting | **1** | LS | $18,500.00 | $18,500 |
| 761 | General Requirements | | | | |
| 762 | Coring, cutting and sleeves | **1** | LS | $15,000.00 | $15,000 |
| 763 | Commissioning | **1** | LS | $25,000.00 | $25,000 |
| 764 | Valves and specialties | **1** | LS | $12,500.00 | $12,500 |
| 765 | Permits & Fees | **1** | LS | $7,850.00 | $7,850 |
| 766 | Test and sterilize | **1** | LS | $18,500.00 | $18,500 |
| 767 | Shop drawings | **1** | LS | $16,500.00 | $16,500 |
| 768 | **D20 PLUMBING TOTAL** | | | | **$2,126,673** |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 769 | | | | | |
| 770 | **D30 HVAC** | | | | |
| 771 | Boilers: | | | | |
| 772 | - B-1 & 2 3,844 MBH | 2 | EA | $84,568.00 | $169,136 |
| 773 | Expantion Tank: | | | | |
| 774 | - ET-1 Thru 3 | 3 | EA | $2,150.00 | $6,450 |
| 775 | Air Separator: | | | | |
| 776 | - AS-1 & 2 8" | 2 | EA | $3,950.00 | $7,900 |
| 777 | Buffer Tank: | | | | |
| 778 | - BT-1 | 1 | EA | $2,500.00 | $2,500 |
| 779 | Pumps: | | | | |
| 780 | - P-1 & 2 HP 790 GPM | **2** | EA | $12,500.00 | $25,000 |
| 781 | - P-3 & 4 HP 800 GPM | **2** | EA | | Pump House |
| 782 | - BP-1 | **2** | EA | $2,500.00 | $5,000 |
| 783 | - CP-1 5 GPH | **5** | EA | $450.00 | $2,250 |
| 784 | Pumps House | **1** | EA | $185,000.00 | $185,000 |
| 785 | | | | | |
| 786 | Chillers: | | | | |
| 787 | - CH-1 350 Ton | **1** | EA | $367,500.00 | $367,500 |
| 788 | Rooftop Units: | | | | |
| 789 | - RTU-1 22,000 CFM | **1** | EA | $264,000.00 | $264,000 |
| 790 | - RTU-2 22,000 CFM | **1** | EA | $264,000.00 | $264,000 |
| 791 | - RTU-3 22,000 CFM | **1** | EA | $264,000.00 | $264,000 |
| 792 | - RTU-4 22,000 CFM | **1** | EA | $264,000.00 | $264,000 |
| 793 | - RTU-5 15,000 CFM | **1** | EA | $180,000.00 | $180,000 |
| 794 | - RTU-6 12,000 CFM | **1** | EA | $144,000.00 | $144,000 |
| 795 | - RTU-7 2,000 CFM | **1** | EA | $28,000.00 | $28,000 |
| 796 | Make Up Units: | | | | |
| 797 | - MAU-1 5,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 798 | Exhaust Fans: | | | | |
| 799 | - EF-1 2,500 CFM | **1** | EA | $3,250.00 | $3,250 |
| 800 | - EF-2 2,500 CFM | **1** | EA | $3,250.00 | $3,250 |
| 801 | - EF-3 500 CFM | **1** | EA | $980.00 | $980 |
| 802 | - EF-4 500 CFM | **1** | EA | $980.00 | $980 |
| 803 | - EF-5 250 CFM | **1** | EA | $685.00 | $685 |
| 804 | - EF-6 250 CFM | **1** | EA | $685.00 | $685 |
| 805 | - SEF-1 50,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 806 | - SEF-2 50,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 807 | - SEF-3 50,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 808 | - SEF-4 50,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 809 | - KEF-1 4,170 CFM | **1** | EA | $4,500.00 | $4,500 |
| 810 | - FEF-1 1,200 CFM | **1** | EA | $2,100.00 | $2,100 |
| 811 | - FEF-2 1,200 CFM | **1** | EA | $2,100.00 | $2,100 |

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137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 812 | - FEF-3 1,200 CFM | 1 | EA | $2,100.00 | $2,100 |
| 813 | VAV Boxes: | | | | |
| 814 | - VAV-8 | 150 | EA | $1,050.00 | $157,500 |
| 815 | Radiant Heat Panels: | | | | |
| 816 | - R1 | 2,525 | LF | $135.00 | $340,875 |
| 817 | Fin-Tube Radiators: | | | | |
| 818 | - FT-1 | 100 | LF | $90.00 | $9,000 |
| 819 | Cabinet & Unit Heaters: | | | | |
| 820 | - CUH-1,2, 7 thru 16 350 MBH | 12 | EA | $895.00 | $10,740 |
| 821 | - CUH-3 1050 MBH | 1 | EA | $1,150.00 | $1,150 |
| 822 | - CUH-4 thru 6 450 MBH | 3 | EA | $925.00 | $2,775 |
| 823 | Ductless Split Units: | | | | |
| 824 | - DCUe-1 1 Ton | 1 | EA | $2,950.00 | $2,950 |
| 825 | - DCUe-2 2 Ton | 1 | EA | $4,425.00 | $4,425 |
| 826 | - DCUe-3 2 Ton | 1 | EA | $4,425.00 | $4,425 |
| 827 | - DCUe-4 1.5 Ton | 1 | EA | $3,850.00 | $3,850 |
| 828 | - DCUe-5 1.5 Ton | 1 | EA | $3,850.00 | $3,850 |
| 829 | - DCUe-6 1.5 Ton | 1 | EA | $3,850.00 | $3,850 |
| 830 | - DCUe-7 1.5 Ton | 1 | EA | $3,850.00 | $3,850 |
| 831 | Register & Diffusers: | | | | |
| 832 | - DD-1 | 22 | EA | $985.00 | $21,670 |
| 833 | - DD-2 | 18 | EA | $985.00 | $17,730 |
| 834 | - DD-3 | 16 | EA | $985.00 | $15,760 |
| 835 | - DD-4 | 1 | EA | $985.00 | $985 |
| 836 | - DD-5 | 42 | EA | $985.00 | $41,370 |
| 837 | - DD-6 | 2 | EA | $985.00 | $1,970 |
| 838 | - DD-7 | 4 | EA | $985.00 | $3,940 |
| 839 | - Slot | 750 | LF | $45.00 | $33,750 |
| 840 | - E | 80 | EA | $225.00 | $18,000 |
| 841 | Misc Diffusers, grills and registers | 1 | LS | $5,000.00 | $5,000 |
| 842 | Fire & Motor Dampers | 30 | LS | $1,850.00 | $55,500 |
| 843 | Volume Dampers | 1 | EA | $40,000.00 | $40,000 |
| 844 | Flex Duct | 1 | LS | $30,000.00 | $30,000 |
| 845 | Misc. Duct Accessories | 1 | LS | $25,000.00 | $25,000 |
| 846 | Double Wall Galvanized Duct (Auditorium) | 8,500 | LBS | $20.25 | $172,125 |
| 847 | Galvanized Duct | 130,000 | LBS | $12.50 | $1,625,000 |
| 848 | Ductsox | 680 | LF | $45.00 | $30,600 |
| 849 | Duct Insulation | 45,000 | SF | $4.65 | $209,250 |
| 850 | Duct Insulation @ Kitchen area | 1 | LS | $35,000.00 | $35,000 |
| 851 | Black iron at kitchen | 2,125 | LBS | $18.50 | $39,313 |
| 852 | Duct S/S | 5,000 | LBS | $20.20 | $101,000 |
| 853 | Seal Ductwork | 7,500 | LF | $1.60 | $12,000 |
| 854 | Dust Collection System | 1 | LS | $25,000.00 | $25,000 |

# Fuller Middle School

Framingham, MA
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## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 855 | Sound Attenuators | | | | |
| 856 | - SA-1S | 1 | EA | $6,500.00 | $6,500 |
| 857 | - SA-1R | 1 | EA | $6,500.00 | $6,500 |
| 858 | - SA-2S | 1 | EA | $6,500.00 | $6,500 |
| 859 | - SA-2R | 1 | EA | $6,500.00 | $6,500 |
| 860 | - SA-3S | 1 | EA | $6,500.00 | $6,500 |
| 861 | - SA-3R | 1 | EA | $6,500.00 | $6,500 |
| 862 | - SA-4S | 1 | EA | $6,500.00 | $6,500 |
| 863 | - SA-4R | 1 | EA | $6,500.00 | $6,500 |
| 864 | - SA-5S | 1 | EA | $6,500.00 | $6,500 |
| 865 | - SA-5R | 1 | EA | $6,500.00 | $6,500 |
| 866 | - SA-6S | 1 | EA | $7,800.00 | $7,800 |
| 867 | - SA-6R | 1 | EA | $6,200.00 | $6,200 |
| 868 | - SA-7S | 1 | EA | $3,850.00 | $3,850 |
| 869 | - SA-7R | 1 | EA | $3,850.00 | $3,850 |
| 870 | - SA-8 | 1 | EA | $4,250.00 | $4,250 |
| 871 | Hot & Chilles Water Piping | | | | |
| 872 | - Large Bore | 9,000 | LF | $40.00 | $360,000 |
| 873 | - Small Bore | 10,500 | LF | $28.00 | $294,000 |
| 874 | Insulate Hot Water Piping | | | | |
| 875 | - Large Bore | 9,000 | LF | $16.95 | $152,550 |
| 876 | - Small Bore | 10,500 | LF | $12.50 | $131,250 |
| 877 | Equipment Hook-Ups: | | | | |
| 878 | - 4" Boilers | 2 | EA | $8,950.00 | $17,900 |
| 879 | - 8" Pump | | EA | | Pump House |
| 880 | - 4" Pump | 3 | EA | $2,100.00 | $6,300 |
| 881 | - 8" Chiller | 1 | EA | $14,500.00 | $14,500 |
| 882 | - RCP | 95 | EA | $1,075.00 | $102,125 |
| 883 | - CUH | 12 | EA | $1,025.00 | $12,300 |
| 884 | - FT | 2 | EA | $1,075.00 | $2,150 |
| 885 | - DD | 105 | EA | $285.00 | $29,925 |
| 886 | - VAV | 140 | EA | $1,105.00 | $154,700 |
| 887 | - 4" RTU Coils | 6 | EA | $6,500.00 | $39,000 |
| 888 | - 2" RTU Coils | 3 | EA | $2,650.00 | $7,950 |
| 889 | VFD | 1 | LS | $20,000.00 | $20,000 |
| 890 | Glycol: | | | | |
| 891 | - GF-1 & 2 | 2 | EA | $6,500.00 | $13,000 |
| 892 | Combustion | 1 | LS | $30,000.00 | $30,000 |
| 893 | Flues S/S boiler | 380 | LF | $120.00 | $45,600 |
| 894 | Seismic Restraints | 1 | LS | $10,500.00 | $10,500 |
| 895 | Misc. Valves & specialties | 1 | LS | $15,000.00 | $15,000 |
| 896 | Commissioning support | 1 | LS | $32,000.00 | $32,000 |
| 897 | Controls | 1 | LS | $755,000.00 | $755,000 |

# *Fuller Middle School*

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## *DETAILED ESTIMATE - NEW CONSTRUCTION*

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 898 | Testing & Balancing | 1 | LS | $35,600.00 | $35,600 |
| 899 | Rigging & Lifting | 1 | LS | $12,500.00 | $12,500 |
| 900 | Permits & Fees | 1 | LS | $8,500.00 | $8,500 |
| 901 | Shop Drawing | 1 | LS | $15,500.00 | $15,500 |
| 902 | **D30 HVAC TOTAL** | | | | **$7,879,869** |
| 903 | | | | | |
| 904 | **D40 FIRE PROTECTION** | | | | |
| 905 | Upright Sprinkler Heads | 260 | EA | $390.00 | $101,400 |
| 906 | Pendent Sprinkler Heads | 817 | EA | $415.00 | $339,055 |
| 907 | Pendent/Upright Sprinkler Heads | 120 | EA | $510.00 | $61,200 |
| 908 | Upright Sprinkler Heads ( Gym) | 70 | EA | $425.00 | $29,750 |
| 909 | Upright Sprinkler Heads ( Auditorium) | 40 | EA | $425.00 | $17,000 |
| 910 | Upright Sprinkler Heads ( Skylights) | 16 | EA | $440.00 | $7,040 |
| 911 | Sidewall Sprinkler Heads | 121 | EA | $514.00 | $62,194 |
| 912 | Window Sprinkler Heads | 22 | EA | $650.00 | $14,300 |
| 913 | Dry Sprinkler Heads | 16 | EA | $495.00 | $7,920 |
| 914 | 8" Water Service | 1 | EA | $6,250.00 | $6,250 |
| 915 | 6" Alarm Valves w/ trim | 1 | EA | $5,560.00 | $5,560 |
| 916 | 6" Backflow Preventer | 1 | EA | $8,500.00 | $8,500 |
| 917 | Zone control w/ standpipe (SCVA) | 14 | EA | $3,650.00 | $51,100 |
| 918 | 6" Riser Valves | 2 | EA | $950.00 | $1,900 |
| 919 | 6" FSP W/ Standpipe | 5 | EA | $2,250.00 | $11,250 |
| 920 | 4" FSP W/ Standpipe | 3 | EA | $2,045.00 | $6,135 |
| 921 | Fire Dept. Connections | 1 | EA | $2,650.00 | $2,650 |
| 922 | Riser Valve w/ tamper switch | 2 | EA | $750.00 | $1,500 |
| 923 | Main piping: | | | | |
| 924 | - 6" | 1,108 | LF | $80.00 | $88,640 |
| 925 | Misc. Valves | 1 | LS | $4,500.00 | $4,500 |
| 926 | Commissioning | 1 | LS | $1,250.00 | $1,250 |
| 927 | Lifting | 1 | LS | $3,800.00 | $3,800 |
| 928 | Testing | 1 | LS | $3,650.00 | $3,650 |
| 929 | Coordination | 1 | LS | $8,100.00 | $8,100 |
| 930 | Coring, Sleeves & sleeves | 1 | LS | $5,450.00 | $5,450 |
| 931 | Seismic Restraints | 1 | LS | $5,900.00 | $5,900 |
| 932 | Shop drawings/hydraulic calculations | 1 | LS | $8,000.00 | $8,000 |
| 933 | **D40 FIRE PROTECTION TOTAL** | | | | **$863,994** |
| 934 | | | | | |
| 935 | ***TOTAL SYSTEM D15 MECHANICAL*** | | | | **$10,870,535** |
| 936 | | | | | |
| 937 | | | | | |
| 938 | ***D50 ELECTRICAL*** | | | | |
| 939 | | | | | |
| 940 | **D5011 SERVICE & DISTRIBUTION** | | | | |

# Fuller Middle School

Framingham, MA
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## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 941 | *Switchgear, Panelboards, Transformers* | | | | |
| 942 | 3000/2500 Amp Main Switchboard | 1 | LS | $110,739.20 | $110,739 |
| 943 | Meter Pan | 1 | EA | $738.10 | $738 |
| 944 | SPD @ Swbd | 1 | EA | $2,855.60 | $2,856 |
| 945 | SPD @ Panelboard | 46 | EA | $1,113.20 | $51,207 |
| 946 | 100 Amp Panel Board | 14 | EA | $4,048.66 | $56,681 |
| 947 | 225 Amp Panel Board | 9 | EA | $6,749.38 | $60,744 |
| 948 | 225 Amp Panel Board, 2-Section | 9 | EA | $11,521.62 | $103,695 |
| 949 | 400 Amp Panel Board | 4 | EA | $9,571.10 | $38,284 |
| 950 | 400 Amp Panel Board, 2-Section | 1 | EA | $16,443.90 | $16,444 |
| 951 | 600 Amp Panel Board | 2 | EA | $13,013.55 | $26,027 |
| 952 | 800 Amp Panel Board | 2 | EA | $16,577.00 | $33,154 |
| 953 | 75 Kva Transformer | 1 | EA | $7,550.40 | $7,550 |
| 954 | 225 Kva Transformer K13 | 3 | EA | $42,713.00 | $128,139 |
| 955 | 800 Amp Disconnect @ Xfmr | 2 | EA | $7,381.00 | $14,762 |
| 956 | Emergency Generator, UPS | | | | |
| 957 | 350 Kw Emergency Generator, WP/Sound | 1 | LS | $147,862.00 | $147,862 |
| 958 | Autotransfer Sw 150A | 1 | EA | $7,148.08 | $7,148 |
| 959 | Autotransfer Sw 225A | 1 | EA | $10,145.85 | $10,146 |
| 960 | Autotransfer Sw 400A | 1 | EA | $12,541.65 | $12,542 |
| 961 | 150 Amp EG Quick Connect | 1 | EA | $3,049.20 | $3,049 |
| 962 | 200/150 Amp Encl Ckt Brkr | 1 | EA | $1,923.90 | $1,924 |
| 963 | 225 Amp Encl Ckt Brkr | 1 | EA | $3,693.53 | $3,694 |
| 964 | 400 Amp Encl Ckt Brkr | 1 | EA | $4,283.40 | $4,283 |
| 965 | 24KW/30Kva UPS, batteries | 2 | LS | $47,432.00 | $94,864 |
| 966 | 200 Amp Disconnect @ UPS | 2 | EA | $1,923.90 | $3,848 |
| 967 | Generator Annunciator | 1 | EA | $1,621.40 | $1,621 |
| 968 | Motors: | | | | |
| 969 | Cond Pump Conn | 12 | EA | $157.30 | $1,888 |
| 970 | Install Limit Switch FBO | 3 | EA | $121.00 | $363 |
| 971 | Install Misc Gym CP FBO | 8 | EA | $465.85 | $3,727 |
| 972 | Motor Backbd Conn's, Swiitch | 8 | EA | $779.24 | $6,234 |
| 973 | Scoreboard Conn's, Switch | 1 | EA | $779.24 | $779 |
| 974 | Bleach Motor 20/3A Conn, Switch | 7 | EA | $779.24 | $5,455 |
| 975 | Manual Snap Switch Starter WP | 5 | EA | $338.80 | $1,694 |
| 976 | 20/2 Amp Disconnect | 19 | EA | $444.07 | $8,437 |
| 977 | 30/1 Amp Disconnect, Elev Cab | 1 | EA | $444.07 | $444 |
| 978 | 30/2 Amp Disconnect, mech | 8 | EA | $584.43 | $4,675 |
| 979 | 30 Amp Disconnect, mech,kit | 16 | EA | $779.24 | $12,468 |
| 980 | 60 Amp Disconnect, mech, kit | 5 | EA | $1,333.42 | $6,667 |
| 981 | 100 Amp Disconnect | 6 | EA | $1,452.00 | $8,712 |
| 982 | 200 Amp Disconnect, Elev | 1 | EA | $2,214.30 | $2,214 |
| 983 | 200/125 Amp Disconnect WP | 4 | EA | $2,214.30 | $8,857 |
| 984 | 200/175 Amp Disconnect WP | 4 | EA | $2,214.30 | $8,857 |
| 985 | 800 Amp Disconnect CH, WP | 1 | EA | $8,845.10 | $8,845 |
| 986 | Junc Box, mech controls by others | 13 | EA | $66.55 | $865 |

# Fuller Middle School

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## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 987 | Install Nema 0 Motor Starter FBO | 11 | EA | $356.95 | $3,926 |
| 988 | Install Nema 1 Motor Starter FBO | 2 | EA | $471.90 | $944 |
| 989 | Install <=10HP VFD FBO | 5 | EA | $1,367.30 | $6,837 |
| 990 | Install 20HP VFD FBO | 2 | EA | $2,081.20 | $4,162 |
| 991 | Install 25HP VFD FBO | 2 | EA | $2,734.60 | $5,469 |
| 992 | Install 50HP VFD FBO | 4 | EA | $3,448.50 | $13,794 |
| 993 | Chiller CP Conn's | 1 | EA | $3,726.80 | $3,727 |
| 994 | | | | | |
| 995 | Power Circuitry | | | | |
| 996 | 3/4" Emt, empty | 520 | LF | $10.61 | $5,518 |
| 997 | 3/4" Emt, 4#12 | 4,760 | LF | $13.85 | $65,924 |
| 998 | 3/4" Emt, 4#10 | 2,880 | LF | $14.98 | $43,149 |
| 999 | 1" Emt, 4#8 | 600 | LF | $21.47 | $12,879 |
| 1000 | 1 1/4" Emt, 4#4 | 200 | LF | $29.05 | $5,810 |
| 1001 | 1 1/4" Emt, 4#2 | 2,790 | LF | $32.34 | $90,238 |
| 1002 | 1 1/2" Emt, 4#1 | 850 | LF | $38.81 | $32,990 |
| 1003 | 2" Emt, 4 1/0 | 930 | LF | $44.39 | $41,287 |
| 1004 | 2" Emt, 4 2/0 | 800 | LF | $48.07 | $38,459 |
| 1005 | 2" Emt, 4 3/0 | 200 | LF | $53.49 | $10,699 |
| 1006 | 2 1/2" Emt, 4 4/0 | 80 | LF | $62.02 | $4,962 |
| 1007 | 2 1/2" Emt, 4 250Mcm | 60 | LF | $66.48 | $3,989 |
| 1008 | 3" Emt, 4 350Mcm | 420 | LF | $81.49 | $34,227 |
| 1009 | 3 1/2" Emt, 4 500 Mcm | 1,820 | LF | $105.02 | $191,129 |
| 1010 | 4#6 MI Cable | 50 | LF | $41.27 | $2,064 |
| 1011 | 4#2 MI Cable | 200 | LF | $83.99 | $16,797 |
| 1012 | | | | | |
| 1013 | Service Grounding | 1 | LS | $5,033.60 | $5,034 |
| 1014 | Lightning Protection System (Preventor) | 1 | LS | $34,485.00 | $34,485 |
| 1015 | | | | | |
| 1016 | Light Fixtures | | | | |
| 1017 | Type G4 | 80 | EA | $886.93 | $70,954 |
| 1018 | Type LK24 | 24 | EA | $474.32 | $11,384 |
| 1019 | Type LP8 | 9 | EA | $1,185.80 | $10,672 |
| 1020 | Type LR2 | 1,173 | EA | $411.40 | $482,572 |
| 1021 | Type LS2 | 1 | EA | $411.40 | $411 |
| 1022 | Type LS4 | 41 | EA | $310.97 | $12,750 |
| 1023 | Type LS4A | 22 | EA | $310.97 | $6,841 |
| 1024 | Type LS8 | 21 | EA | $621.94 | $13,061 |
| 1025 | Type LUL | 61 | EA | $310.97 | $18,969 |
| 1026 | Type PC1 | 24 | EA | $381.15 | $9,148 |
| 1027 | Type PC2 | 29 | EA | $381.15 | $11,053 |
| 1028 | Type PC3 | 186 | EA | $381.15 | $70,894 |
| 1029 | Type RC1 | 88 | EA | $381.15 | $33,541 |
| 1030 | Type RC2 | 56 | EA | $381.15 | $21,344 |
| 1031 | Type RSH | 1 | EA | $393.25 | $393 |
| 1032 | Type SP1 | 83 | EA | $617.10 | $51,219 |

# Fuller Middle School

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## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 1033 | Type SL4 Exterior Wallpack | **17** | EA | $701.80 | $11,931 |
| 1034 | Type Exit | **71** | EA | $332.75 | $23,625 |
| 1035 | Type LC2 | **72** | LF | $114.35 | $8,233 |
| 1036 | Type LC3 | **3,090** | LF | $114.35 | $353,326 |
| 1037 | Type LWS | **624** | LF | $124.03 | $77,392 |
| 1038 | Type LSL | **60** | LF | $130.08 | $7,805 |
| 1039 | | | | | |
| 1040 | Branch Circuitry | | | | |
| 1041 | 3/4" Emt, 4#12 | **15,624** | LF | $12.65 | $197,635 |
| 1042 | MC Cable | **46,871** | LF | $5.18 | $242,733 |
| 1043 | 3/4" Emt, 4#10 | **880** | LF | $16.66 | $14,662 |
| 1044 | 1" Emt, 4#8 | **60** | LF | $21.47 | $1,288 |
| 1045 | 1" Emt, 4#6 | **160** | LF | $22.87 | $3,659 |
| 1046 | Plenum Cable | **9,930** | LF | $1.59 | $15,740 |
| 1047 | | | | | |
| 1048 | Wiring Devices | | | | |
| 1049 | Switches | **11** | EA | $78.65 | $865 |
| 1050 | Momentary Contact Switches | **9** | EA | $124.03 | $1,116 |
| 1051 | OS, PS Power Pack | **145** | EA | $181.50 | $26,318 |
| 1052 | Local Switch/Dimming Station L | **226** | EA | $151.25 | $34,183 |
| 1053 | Occupancy Sensor | **322** | EA | $202.68 | $65,261 |
| 1054 | Photo Sensor | **114** | EA | $202.68 | $23,105 |
| 1055 | Receptacles | **512** | EA | $78.65 | $40,269 |
| 1056 | Junc Boxes, Misc | **5** | EA | $64.13 | $321 |
| 1057 | Receptacles GFI | **217** | EA | $96.80 | $21,006 |
| 1058 | Receptacles Quad | **317** | EA | $129.47 | $41,042 |
| 1059 | Receptacles GFI Quad | **5** | EA | $159.72 | $799 |
| 1060 | Receptacles GFI WP | **24** | EA | $177.87 | $4,269 |
| 1061 | Receptacles w/ I/O Module | **28** | EA | $96.80 | $2,710 |
| 1062 | Receptacles Quad w/ I/O Modules | **3** | EA | $181.50 | $545 |
| 1063 | Receptacle USB | **13** | EA | $102.85 | $1,337 |
| 1064 | Cord Reel Receptacle | **7** | EA | $580.80 | $4,066 |
| 1065 | Cond Pump Conn | **12** | EA | $133.10 | $1,597 |
| 1066 | Install Leak Det FBO | **12** | EA | $121.00 | $1,452 |
| 1067 | Sol Valve Conn | **2** | EA | $121.00 | $242 |
| 1068 | FS Conn | **7** | EA | $121.00 | $847 |
| 1069 | GSM Conn | **7** | EA | $121.00 | $847 |
| 1070 | Floor Power Outlet | **2** | EA | $399.30 | $799 |
| 1071 | 4-Pole Lighting Contactor | **1** | EA | $635.25 | $635 |
| 1072 | 12-Pole Lighting Contactor | **1** | EA | $1,500.40 | $1,500 |
| 1073 | EPO Pushbutton | **3** | EA | $229.90 | $690 |
| 1074 | Fume Hood Conn | **3** | EA | $157.30 | $472 |
| 1075 | Manual Snap Switch Starter VRF, VAV,misc | **177** | EA | $181.50 | $32,126 |
| 1076 | 20/1 Amp Receptacle L5-20 | **11** | EA | $84.70 | $932 |
| 1077 | 20/1 Amp Eqpt Conn | **12** | EA | $66.55 | $799 |
| 1078 | 30/1 Amp Receptacle L5-30 | **11** | EA | $117.98 | $1,298 |

# Fuller Middle School

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## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 1079 | 30 Amp Receptacle | 3 | EA | $130.08 | $390 |
| 1080 | 30 Amp Stage Receptacle / strip conn | 8 | EA | $798.60 | $6,389 |
| 1081 | 50 Amp Receptacle | 1 | EA | $193.60 | $194 |
| 1082 | 60 Amp Receptacle, weld | 2 | EA | $205.70 | $411 |
| 1083 | | | | | |
| 1084 | Fire Alarm | | | | |
| 1085 | Teflon Cable | 33,345 | LF | $2.34 | $78,113 |
| 1086 | 3" Rigid, Riser Cables | 60 | LF | $114.95 | $6,897 |
| 1087 | Pull Station | 24 | EA | $229.90 | $5,518 |
| 1088 | Audible/Visual | 205 | EA | $347.88 | $71,314 |
| 1089 | Audible/Visual WP | 1 | EA | $405.35 | $405 |
| 1090 | Smoke Detector | 158 | EA | $387.20 | $61,178 |
| 1091 | CO Detector | 5 | EA | $350.90 | $1,755 |
| 1092 | Beam-Type Smoke Detector | 11 | EA | $1,052.70 | $11,580 |
| 1093 | Strobe | 51 | EA | $229.90 | $11,725 |
| 1094 | WP Beacon | 2 | EA | $287.38 | $575 |
| 1095 | Duct Detector | 40 | EA | $889.35 | $35,574 |
| 1096 | Central Equipment, testing, Voice Command | 1 | LS | $66,477.40 | $66,477 |
| 1097 | Radio Box, Antenna, wiring | 1 | EA | $4,549.60 | $4,550 |
| 1098 | Fused Disc | 1 | EA | $738.10 | $738 |
| 1099 | Door Release DH | 6 | EA | $459.80 | $2,759 |
| 1100 | Ansul Conn's | 1 | LS | $895.40 | $895 |
| 1101 | Remote Mic EVAC | 1 | EA | $580.80 | $581 |
| 1102 | Annunciator Panel | 3 | EA | $2,323.20 | $6,970 |
| 1103 | Misc Connections, Relays | 25 | EA | $272.25 | $6,806 |
| 1104 | Knox Box | 1 | EA | $520.30 | $520 |
| 1105 | | | | | |
| 1106 | Communications System | | | | |
| 1107 | MDF Rack, PP's, Terms | 1 | EA | $14,762.00 | $14,762 |
| 1108 | IDF Rack, PP's, Terms | 3 | EA | $7,381.00 | $22,143 |
| 1109 | 4" Floor Sleeves | 16 | EA | $229.90 | $3,678 |
| 1110 | 4" Wall Sleeves | 16 | EA | $229.90 | $3,678 |
| 1111 | Main Ground Bar | 1 | EA | $1,476.20 | $1,476 |
| 1112 | Tel Ground Bar | 3 | EA | $738.10 | $2,214 |
| 1113 | #3/0G Wire | 600 | LF | $9.19 | $5,511 |
| 1114 | Cable Tray 24" Alum | 1,570 | LF | $41.62 | $65,350 |
| 1115 | 12 Strand Multi-Mode Fiber | 600 | LF | $6.18 | $3,710 |
| 1116 | 6 Strand Multi-Mode Fiber | 600 | LF | $4.30 | $2,577 |
| 1117 | Cu Distr Cable | 600 | LF | $10.29 | $6,171 |
| 1118 | 1" EMT CDT | 172 | LF | $14.40 | $2,477 |
| 1119 | 2" EMT CDT | 1,040 | LF | $22.90 | $23,819 |
| 1120 | 4" EMT Cdt | 200 | LF | $34.64 | $6,928 |
| 1121 | Cat 6 Cable | 103,500 | LF | $1.59 | $164,058 |
| 1122 | WAP Outlet AN 2c | 14 | EA | $89.54 | $1,254 |
| 1123 | Tel Outlet | 60 | EA | $72.60 | $4,356 |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 1124 | Data Outlet | 2 | EA | $72.60 | $145 |
| 1125 | Data Duplex Outlet 2c | 78 | EA | $89.54 | $6,984 |
| 1126 | Tel/Data Outlet 3c | 76 | EA | $111.93 | $8,506 |
| 1127 | Floor Tel/Data Outlet 3c | 6 | EA | $399.30 | $2,396 |
| 1128 | Tel/Data Outlet T 2c | 47 | EA | $89.54 | $4,208 |
| 1129 | TVE 2c | 50 | EA | $169.40 | $8,470 |
| 1130 | TVC 2c | 2 | EA | $169.40 | $339 |
| 1131 | | | | | |
| 1132 | Clock/ Public Address System: | | | | |
| 1133 | 2 1/2" Emt, Riser Cables | 50 | LF | $66.74 | $3,337 |
| 1134 | 3/4" EMT Cdt | 2,730 | LF | $11.93 | $32,571 |
| 1135 | 1" EMT Cdt | 2,530 | LF | $14.40 | $36,429 |
| 1136 | Comm Cable | 14,100 | LF | $1.59 | $22,350 |
| 1137 | Main Sound Rack | 1 | LS | $48,884.00 | $48,884 |
| 1138 | Local Sound System Rack | 2 | EA | $7,792.40 | $15,585 |
| 1139 | Outlet S Speaker | 232 | EA | $254.10 | $58,951 |
| 1140 | Outlet S Speaker WP | 19 | EA | $344.85 | $6,552 |
| 1141 | Volume Control | 26 | EA | $181.50 | $4,719 |
| 1142 | Master Clock GPS | 1 | EA | $5,493.40 | $5,493 |
| 1143 | Clock Antenna | 1 | EA | $1,863.40 | $1,863 |
| 1144 | Wireless Clock Transceiver | 1 | EA | $2,855.60 | $2,856 |
| 1145 | Wireless Clock Repeater | 4 | EA | $1,427.80 | $5,711 |
| 1146 | Clock, wireless | 73 | EA | $254.10 | $18,549 |
| 1147 | | | | | |
| 1148 | A/V System: | | | | |
| 1149 | 1" EMT Cdt | 1,600 | LF | $14.40 | $23,038 |
| 1150 | BP Button Panel | 41 | EA | $99.83 | $4,093 |
| 1151 | R1 Receptacle Panel | 41 | EA | $99.83 | $4,093 |
| 1152 | V1 Video Projector | 41 | EA | $99.83 | $4,093 |
| 1153 | S1 Speaker | 82 | EA | $99.83 | $8,186 |
| 1154 | AV Eqpt, Inst, LV Wiring - Proj/Assist List | 41 | RM | $0.00 | $0 |
| 1155 | J1 | 2 | EA | $99.83 | $200 |
| 1156 | Data Outlet P Projector | 1 | EA | $99.83 | $100 |
| 1157 | Screen | 1 | EA | $99.83 | $100 |
| 1158 | R2 Receptacle Panel | 4 | EA | $169.40 | $678 |
| 1159 | R3 Receptacle Panel | 4 | EA | $169.40 | $678 |
| 1160 | Speaker S1 Backbox | 4 | EA | $99.83 | $399 |
| 1161 | Speaker S2 Backbox | 4 | EA | $99.83 | $399 |
| 1162 | Speaker S3 Backbox | 14 | EA | $99.83 | $1,398 |
| 1163 | AV Rack Enclosure | 1 | EA | $459.80 | $460 |
| 1164 | AV Eqpt, Installation, LV Wiring - ALLOW | 1 | LS | $0.00 | $0 |
| 1165 | Gym Sound System Mat'l Package | 1 | LS | $45,000.00 | $45,000 |
| 1166 | Auditorium AV Roughin | 1 | LS | $45,000.00 | $45,000 |
| 1167 | ) | | | | |
| 1168 | Theater Lighting & Control System:ALLOW (Eqpt in "Equipment Section") | | | | |
| 1169 | Lighting and Controls included in "Equipment Section" | | | | |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 1170 | Theat Lighting & Power Roughin | 1 | LS | $30,000.74 | $30,001 |
| 1171 | Theat Lighting Controls Roughin | 1 | LS | $10,000.25 | $10,000 |
| 1172 | | | | | |
| 1173 | Security Intrusion Alarm System: | | | | |
| 1174 | Power Supply Junc Box, 120v | 1 | EA | $459.80 | $460 |
| 1175 | Central Eqpt | 1 | EA | $14,713.60 | $14,714 |
| 1176 | 3/4" Emt, 4#12 | 40 | LF | $13.85 | $554 |
| 1177 | Plenum Cables | 4,800 | LF | $1.59 | $7,608 |
| 1178 | 3/4" Emt | 720 | LF | $11.93 | $8,590 |
| 1179 | CR Card Reader | 9 | EA | $810.70 | $7,296 |
| 1180 | K Keypad | 2 | EA | $810.70 | $1,621 |
| 1181 | EL Electric Lock | 5 | EA | $490.05 | $2,450 |
| 1182 | EH Electric Hinge | 30 | EA | $490.05 | $14,702 |
| 1183 | Intercom | 2 | EA | $520.30 | $1,041 |
| 1184 | PT Install Power Transfer Hinge FBO | 16 | EA | $411.40 | $6,582 |
| 1185 | REX Req to Exit | 21 | EA | $290.40 | $6,098 |
| 1186 | DC Door Position Sw | 54 | EA | $199.65 | $10,781 |
| 1187 | M Motion Sensor | 71 | EA | $411.40 | $29,209 |
| 1188 | TS Door Switch | 16 | EA | $181.50 | $2,904 |
| 1189 | DJ Door Junc Box | 16 | EA | $139.15 | $2,226 |
| 1190 | | | | | |
| 1191 | CCTV System: | | | | |
| 1192 | 3/4" EMT Cdt | 870 | LF | $11.41 | $9,927 |
| 1193 | Signal Cables | 11,400 | LF | $1.59 | $18,070 |
| 1194 | Monitoring/Recording Eqpt | 1 | LS | $33,577.50 | $33,578 |
| 1195 | Viewing Console | 2 | EA | $1,161.60 | $2,323 |
| 1196 | Data Outlet CAM, Camera | 55 | EA | $1,294.70 | $71,209 |
| 1197 | Data Outlet CAM, Camera WP | 15 | EA | $1,996.50 | $29,948 |
| 1198 | | | | | |
| 1199 | BDA System | 1 | LS | $136,000.00 | $136,000 |
| 1200 | Area of Rescue Assistance | 1 | LS | $20,000.00 | $20,000 |
| 1201 | | | | | |
| 1202 | Temp Power and Lighting | 1 | LS | $89,540.00 | $89,540 |
| 1203 | **D5011 SERVICE & DISTRIBUTION TOTAL** | | | | **$5,523,083** |
| 1204 | | | | | |
| 1205 | ***TOTAL SYSTEM D50 ELECTRICAL*** | | | | **$5,523,083** |
| 1206 | | | | | |
| 1207 | | | | | |
| 1208 | ***E10 EQUIPMENT*** | | | | |
| 1209 | | | | | |
| 1210 | **E1020 INSTITUTIONAL EQUIPMENT** | | | | |
| 1211 | *Projection Screens* | | | | |
| 1212 | Motorized projection screen; Auditorium | 1 | EA | $17,000.00 | $17,000 |
| 1213 | Projection screen - Media Center, room 1250 | 2 | EA | $3,000.00 | $6,000 |
| 1214 | *Residential Appliances* | | | | |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | | TOTAL |
|---|---|---|---|---|---|---|
| 1215 | Refrigerator/Freezer, microwave oven | **5** | RMS | $1,700.00 | | $8,500 |
| 1216 | Dishwasher | **1** | EA | $1,200.00 | | $1,200 |
| 1217 | Undercounter refrigerator @ Nurse | **1** | EA | $1,200.00 | | $1,200 |
| 1218 | *Food service equipment* | | | | | |
| 1219 | Dining & Food Service (Budget provided, July 19, 2019) | **1** | AL | $415,270.00 | | $415,270 |
| 1220 | *Auditorium/Theatre Equipment* | | | | | |
| 1221 | AV | **1** | AL | $200,000.00 | | $200,000 |
| 1222 | Lighting | **1** | AL | $129,018.00 | | $129,018 |
| 1223 | Dimming | **1** | AL | $95,749.00 | | $95,749 |
| 1224 | Rigging | **1** | AL | $158,300.00 | | $158,300 |
| 1225 | Curtains | **1** | AL | $33,854.00 | | $33,854 |
| 1226 | Orchestra | **1** | AL | $175,000.00 | FF&E | |
| 1227 | Gym AV sound system | **1** | AL | $120,000.00 | | $120,000 |
| 1228 | Cafeteria AV | **1** | AL | $50,000.00 | | $50,000 |
| 1229 | Band and chorus AV | **1** | AL | $60,000.00 | | $60,000 |
| 1230 | Aud. seating; stacked (48), fixed (321), removeable (46) | **1** | AL | $106,445.00 | | $106,445 |
| 1231 | *Science Room Equipment* | | | | | |
| 1232 | Fume hoods | **6** | EA | $10,000.00 | NIC | |
| 1233 | *Gymnasium equipment* | | | | | |
| 1234 | Electronic scoreboard | **1** | EA | $7,500.00 | | $7,500 |
| 1235 | Shot clock/shot timer | **1** | EA | $1,250.00 | | $1,250 |
| 1236 | Pull up bar | **1** | EA | $850.00 | | $850 |
| 1237 | Stall bar | **1** | EA | $850.00 | | $850 |
| 1238 | Vertical ladder | **1** | EA | $550.00 | | $550 |
| 1239 | Rope hoist | **1** | EA | $500.00 | | $500 |
| 1240 | Overhead mounted folding backstops w/glass backboards | **6** | EA | $6,500.00 | | $39,000 |
| 1241 | Gym motorized divider curtains | **1** | EA | $20,000.00 | | $20,000 |
| 1242 | Sleeves & floor plates for badminton & volleyball uprights; allov | **2** | SETS | $4,000.00 | | $8,000 |
| 1243 | Gym equipment controls-power touch | **1** | LS | $5,000.00 | | $5,000 |
| 1244 | Gym wall safety pads to be 8'-8" high | **2,634** | SF | $18.00 | | $47,412 |
| 1245 | Motorized telescoping bleachers, motorized | **760** | SEAT | $100.00 | | $76,000 |
| 1246 | Shop equipment | **1** | LS | $25,000.00 | | $25,000 |
| 1247 | Loading dock equipment | **1** | LS | $10,000.00 | | $10,000 |
| 1248 | **E1020 INSTITUTIONAL EQUIPMENT TOTAL** | | | | | **$1,644,448** |
| 1249 | | | | | | |
| 1250 | ***TOTAL SYSTEM E10 FITTINGS & EQUIPMENT*** | | | | | **$1,644,448** |
| 1251 | | | | | | |
| 1252 | | | | | | |
| 1253 | ***E20 FURNISHINGS*** | | | | | |
| 1254 | | | | | | |
| 1255 | **E2020 SPECIALTIES / MILLWORK** | | | | | |
| 1256 | *Interior guardrails* | | | | | |
| 1257 | Handrailing | **150** | LF | $200.00 | | $30,000 |

# Fuller Middle School

Framingham, MA
137,385 GSF

## DETAILED ESTIMATE - NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | | TOTAL |
|---|---|---|---|---|---|---|
| 1258 | Guardrail in Common areas | **365** | LF | $103.00 | | $37,595 |
| 1259 | Guardrails at lockers | **1,000** | LF | $550.00 | BP#2 | |
| 1260 | Railings in auditorium | **1** | LS | $35,000.00 | | $35,000 |
| 1261 | Vertical duct enclosure | **4,200** | LF | $90.00 | NIC | |
| 1262 | | | | | | |
| 1263 | *Miscellaneous metals* | | | | | |
| 1264 | Furnishings; miscellaneous metals | **137,385** | GSF | $0.35 | | $48,085 |
| 1265 | | | | | | |
| 1266 | Furnishings; miscellaneous wood blocking | **137,385** | GSF | $0.25 | | $34,346 |
| 1267 | | | | | | |
| 1268 | *Academic areas: classrooms, science, media, music, vocational, sped* | | | | | |
| 1269 | Bench; wood veneer cantilevered w/ptd supports | **69** | LF | $350.00 | | $24,150 |
| 1270 | Epoxy counter 24" wide | **325** | LF | $325.00 | | $105,625 |
| 1271 | Plam admin desk, curved @ Admin | **20** | LF | $500.00 | | $10,000 |
| 1272 | Plam base cabinet | **35** | LF | $205.00 | | $7,175 |
| 1273 | Plam base cabinet; mobile on casters | **175** | EA | $550.00 | | $96,250 |
| 1274 | Plam counter 24" wide | **1,425** | LF | $200.00 | | $285,000 |
| 1275 | Plam tall cabinets | **4** | EA | $1,000.00 | | $4,000 |
| 1276 | Plam tall cabinets w/tackable surface | **3** | EA | $1,250.00 | | $3,750 |
| 1277 | Plam upper cabinet | **197** | LF | $175.00 | | $34,475 |
| 1278 | Plam work counter oval @ Admin | **10** | LF | $350.00 | | $3,500 |
| 1279 | Shadow relief | **125** | LF | $1,200.00 | | $150,000 |
| 1280 | *Administration areas, Offices, Medical:* | | | | | |
| 1281 | plam custom base & upper cabinets w/solid surface counter | **20** | LF | $715.00 | | $14,300 |
| 1282 | tackable surface backsplash | **160** | SF | $24.00 | | $3,840 |
| 1283 | Interior panel grille | **450** | LF | $150.00 | | $67,500 |
| 1284 | (4) Adj shelves 12" wide melamine | **602** | LF | $140.00 | | $84,280 |
| 1285 | (6) Adj shelves 12" wide melamine @ Media | **56** | LF | $210.00 | | $11,760 |
| 1286 | *Other areas:* | | | | | |
| 1287 | Mail slots, melamine | **16** | LF | $250.00 | | $4,000 |
| 1288 | Window treatment, manually operated roller shades | **10,288** | SF | $6.00 | | $61,728 |
| 1289 | motorized roller shades @ exterior CW and SF | **1,456** | SF | $10.00 | | $14,560 |
| 1290 | motorized shade units at skylights | **4,015** | SF | $10.00 | | $40,150 |
| 1291 | roller shade at interior doors w/lites & glazed partitions | **5,569** | SF | $4.00 | | $22,276 |
| 1292 | Perforated arch grille curved @ Classrooms 1' h | **1,345** | LF | $55.00 | | $73,975 |
| 1293 | **E2020 SPECIALTIES / MILLWORK TOTAL** | | | | | **$1,307,320** |
| 1294 | | | | | | |
| 1295 | ***TOTAL SYSTEM E20 FURNISHINGS*** | | | | | **$1,307,320** |
| 1296 | | | | | | |
| 1297 | | | | | | |
| 1298 | ***F10 SPECIAL CONSTRUCTION*** | | | | | |
| 1299 | | | | | | |
| 1300 | **F1010 SPECIAL CONSTRUCTION** | | | | | |

# *Fuller Middle School*

Framingham, MA
137,385 GSF

## *DETAILED ESTIMATE - NEW CONSTRUCTION*

| | DESCRIPTION | QUANTITY | UNIT | RATE/UNIT | TOTAL |
|---|---|---|---|---|---|
| 1301 | No work in this section | | | | |
| 1302 | **F1010 SPECIAL CONSTRUCTION TOTAL** | | | | **$0** |
| 1303 | | | | | |
| 1304 | ***TOTAL SYSTEM F10 SPECIAL CONSTRUCTION*** | | | | **$0** |
| 1305 | | | | | |
| 1306 | | | | | |
| 1307 | ***F20 SELECTIVE DEMOLITION*** | | | | |
| 1308 | | | | | |
| 1309 | **F2020 SELECTIVE DEMOLITION** | | | | |
| 1310 | Demolition of existing building allowance | **195,400** | SF | | |
| 1311 | Haz mat removal allowance | | | | |
| 1312 | **F2020 SELECTIVE DEMOLITION TOTAL** | | | | **$0** |
| 1313 | | | | | |
| 1314 | ***TOTAL SYSTEM F20 DEMOLITION*** | | | | **$0** |
| 1315 | | | | | |
| 1316 | | | | **TOTAL BUILDING SUMMARY** | **$42,156,411** |
| 1317 | | | | | |

# *Fuller Middle School*

Framingham, MA
137,385 GSF

## *SITEWORK: NEW CONSTRUCTION*

| | *DESCRIPTION* | *QUANTITY* | *UNIT* | *UNIT COST* | *TOTAL* |
|---|---|---|---|---|---|
| 10 | ***G10 SITE PREPARATION*** | | | | |
| 11 | | | | | |
| 12 | **G1010 Site Clearing** | | | | |
| 13 | *31 10 00 Site Clearing* | | | | |
| 14 | Site clearing | **7.3** | ACRE | $5,000.00 | BP#1 |
| 15 | Safety barricade | **1** | AL | $60,000.00 | BP#1 |
| 16 | Construction fence, install, maintain, remove & reinstall; for all phases | **11,344** | LF | $12.00 | BP#1 |
| 17 | Double construction gate | **2** | PR | $2,500.00 | BP#1 |
| 18 | Temporary construction entrance | **2** | LOC | $7,000.00 | BP#1 |
| 19 | Add premium for moving and reinstalling for 3 phases | **1** | LS | $37,385.00 | BP#1 |
| 20 | Temporary Jersey Barriers; purchase and install | **3,145** | LF | $65.00 | BP#1 |
| 21 | Temp signs | **1** | LS | $3,000.00 | BP#1 |
| 22 | Wash down/re-fueling/parking allowance | **3,000** | SF | $2.00 | BP#1 |
| 23 | *31 23 19 Dewatering and Drainage* | | | | |
| 24 | Dewatering for sitework excavation; allow | **1** | LS | $100,000.00 | BP#1 |
| 25 | *31 25 00 Erosion and Sedimentation Controls* | | | | |
| 26 | Erosion control barrier | **1,206** | LF | $14.00 | BP#1 |
| 27 | Stockpile area (all phases), qty provided | **35,000** | CY | $2.50 | BP#1 |
| 28 | FM; discharge temp basin to existing DMH | **271** | LF | $75.00 | BP#1 |
| 29 | Stormwater basin | **3,547** | SF | $2.50 | BP#1 |
| 30 | Temporary pavement | **47,106** | SF | $3.00 | BP#1 |
| 31 | Temporary sedimentation and runoff basin | **7,348** | SF | $2.00 | BP#1 |
| 32 | **G1010 Site Clearing Total** | | | | **$0** |
| 33 | | | | | |
| 34 | **G1020 Site Demolition and Relocation** | | | | |
| 35 | *02 41 00 Demolition* | | | | |
| 36 | BP#1 | | | | BP#1 |
| 37 | *G1020.01 Building Demolition* | | | | |
| 38 | *02 30 00 Building Demolition* | | | | |
| 39 | Building demoltion | | | | See Main Summary |
| 40 | **G1020 Site Demolition and Relocation Total** | | | | **$0** |
| 41 | | | | | |
| 42 | G1030 Site Earthwork | | | | |
| 43 | 32 18 00 Athletic and Recreational Surfacing | | | | |
| 44 | Site prep | **258,370** | SF | $1.00 | $258,370 |
| 243 | Trench and backfill only | **313** | LF | $45.00 | $14,085 |
| 45 | Baseball field | | | | Existing to Remain |
| 58 | **G1030 Site Earthwork Total** | | | | **$272,455** |
| 59 | | | | | |
| 60 | ***G10 SITE PREPARATION TOTAL*** | | | | **$272,455** |
| 61 | | | | | |

# Fuller Middle School

Framingham, MA
137,385 GSF

## SITEWORK: NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|---|
| 62 | | | | | |
| 63 | **G20 SITE IMPROVEMENTS** | | | | |
| 64 | | | | | |
| 65 | **G2020 Roadways** | | | | |
| 66 | *32 12 00 Flexible Paving* | | | | |
| 67 | Existing public roadway 'Flagg Drive' to remain | | SF | | ETR |
| 68 | Vehicular asphalt pavement, incl's temporary pavement | **202,060** | SF | $3.00 | BP#1 |
| 69 | Raised bituminous pavement (stamped) | **11,716** | SF | $15.00 | BP#1 |
| 70 | Gravel base to roadway & parking lot | **9,445** | CY | $35.00 | BP#1 |
| 71 | 32 16 00 Curbs and Gutters | | | | BP#1 |
| 72 | VGC; vertical granite curb | **3,965** | LF | $42.00 | BP#1 |
| 73 | SGC; sloped granite curb | **191** | LF | $43.50 | BP#1 |
| 74 | PCC; precast concrete curb | **8,105** | LF | $25.00 | BP#1 |
| 75 | Bit. berm curb | **1,336** | LF | $5.00 | BP#1 |
| 76 | 32 17 00 Paving Specialties | | | | BP#1 |
| 77 | Crosswalk | **2,350** | SF | $2.50 | BP#1 |
| 78 | Parking stall painting | **302** | EA | $15.00 | BP#1 |
| 79 | Parking stall painting; HC | **12** | EA | $75.00 | BP#1 |
| 80 | Crosswalk striping, temporary | **2,440** | SF | $2.50 | BP#1 |
| 81 | Temporary parking spaces, incl's HC bus | **162** | EA | $75.00 | BP#1 |
| 82 | Jersey barrier between vehicle parking, temporary | **745** | LF | $10.00 | BP#1 |
| 83 | Misc. marking other than above | **1** | LS | $50,000.00 | BP#1 |
| 84 | **G2020 Roadways Total** | | | | **$0** |
| 85 | | | | | |
| 86 | **G2030 Pedestrian Paving** | | | | |
| 87 | 32 13 10 Rigid Paving | | | | |
| 88 | Concrete paving/Conc sidewalk | **17,115** | SF | $9.00 | $154,035 |
| 89 | Bituminous conc sidewalk | **26,443** | SF | $2.25 | BP#1 |
| 90 | Gravel base to concrete pavement | **807** | CY | $35.00 | $28,245 |
| 90 | Peastone drip edge around building; 1'-6" wide | **50** | CY | $75.00 | $3,750 |
| 90 | Stonedust paving | **1** | LS | $1,750.00 | $1,750 |
| 91 | Curb cut | **15** | EA | $450.00 | $6,750 |
| 92 | Concrete pad | **1** | AL | $24,000.00 | BP#1 |
| 93 | Handicap ramp | **402** | SF | $20.00 | BP#1 |
| 94 | Temporary modular handicap ramp | **138** | SF | $20.00 | BP#1 |
| 95 | **G2030 Pedestrian Paving Total** | | | | **$194,530** |
| 96 | | | | | |
| 97 | **G2040 Site Development** | | | | |
| 98 | *G2040.01 Fences and Gates* | | | | |
| 99 | 32 31 00 Fences and Gates | | | | |
| 100 | Vehicular guardrail | **271** | LF | $250.00 | $67,750 |
| 127 | Wooden guardrail det 7/L3.0 | **992** | LF | $75.00 | $74,400 |

# Fuller Middle School

Framingham, MA
137,385 GSF

## SITEWORK: NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|---|
| 127 | gates | **2** | EA | $2,500.00 | $5,000 |
| 127 | Galvanized handrails @ ramps and steps | **219** | LF | $250.00 | $54,750 |
| 102 | *Unit block retaining wall* | | | | |
| 103 | Footing | *361* | *lf* | | |
| 104 | Concrete | **28** | CY | $135.00 | $3,780 |
| 105 | Concrete; place | **28** | CY | $85.00 | $2,380 |
| 106 | Reinforing | **1,820** | LBS | $1.10 | $2,002 |
| 107 | Formwork | **2,166** | SF | $12.00 | $25,992 |
| 108 | *Wall* | *1,264* | *sf* | | |
| 109 | Concrete material | **42** | CY | $135.00 | $5,670 |
| 110 | Concrete; place | **42** | CY | $85.00 | $3,570 |
| 111 | Reinforing | **6,300** | LBS | $1.10 | $6,930 |
| 112 | Formwork | **2,166** | SF | $12.00 | $25,992 |
| 113 | Wall | **1,264** | SF | $28.00 | $35,378 |
| 127 | Concrete bench w/wooden top | **20** | LF | $275.00 | $5,500 |
| 127 | | | | | |
| 127 | Flagpole | **2** | EA | $7,500.00 | $15,000 |
| 127 | Bandshell | **1** | AL | $200,000.00 | $200,000 |
| 128 | Traffic signs | **1** | AL | $10,000.00 | BP#1 |
| 129 | Bollards | **103** | EA | $800.00 | $82,400 |
| 130 | Premium for architectural featured bollards | **1** | LS | $75,000.00 | $75,000 |
| 131 | Signage | **1** | AL | $15,000.00 | BP#1 |
| 132 | Bicycle racks | **20** | EA | $950.00 | $19,000 |
| 132 | Basketball pavement | | | | BP#1 |
| 133 | Basketball court; fence, gate, court marking | **1,750** | SF | $35.00 | $61,250 |
| 134 | **G2040 Site Development Total** | | | | **$771,744** |
| 135 | | | | | |
| 136 | **G2050 Landscaping** | | | | |
| 137 | *G2050.02 Lawns and Grasses* | | | | |
| 138 | *32 92 00 Turfs and Grasses* | | | | |
| 139 | Topsoil for planting beds, shrubs and perennials | **276** | CY | $25.00 | $6,900 |
| 149 | Sports field mix (seed) | **258,370** | SF | $0.35 | $90,430 |
| 140 | Native wildflower meadow | **104,342** | SF | $0.50 | $52,171 |
| 141 | Lawn (seed) | **121,052** | SF | $0.35 | $42,368 |
| 142 | Sod at ampitheater | **25,902** | SF | $1.50 | $38,853 |
| 143 | Sod at play areas | **24,038** | SF | $1.50 | $36,057 |
| 144 | Plant bed | **7,900** | SF | $10.00 | $79,000 |
| 145 | Mulch | **1** | LS | $30,000.00 | $30,000 |
| 147 | Remove and install new irrigation System | **82,000** | SF | $1.25 | $102,500 |
| 147 | South Sports Field | | | | By Others |
| 148 | Irrigation in front of Ampitheater | **25,902** | SF | $2.00 | $51,804 |
| 148 | Irrigation at play areas | **24,038** | SF | $2.00 | $48,076 |

# Fuller Middle School

Framingham, MA
137,385 GSF

## SITEWORK: NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|---|
| 150 | Fine grading | **121,052** | SF | $0.75 | $90,789 |
| 152 | | | | | |
| 153 | *G2050.03 Trees, Plants and Ground Covers* | | | | |
| 154 | *32 93 00 Plants* | | | | |
| 155 | *Trees* | | | | |
| 156 | AL; Allegheny Serviceberry 2½ - 3" Cal | **12** | EA | $900.00 | $10,800 |
| 157 | AC; Shadblow Serviceberry 2½ - 3" Cal | **1** | EA | $900.00 | $900 |
| 158 | AR; Red Maple 3 - 3½" Cal | **6** | EA | $850.00 | $5,100 |
| 159 | CK; American Yellowwood 3 - 3½" Cal | **24** | EA | $800.00 | $19,200 |
| 160 | FG; American Beech 3 - 3½" Cal | **11** | EA | $850.00 | $9,350 |
| 161 | LT; Tulip Tree 3 - 3½" Cal | **8** | EA | $900.00 | $7,200 |
| 162 | NS; Black Tupelo 3 - 3½" Cal | **15** | EA | $850.00 | $12,750 |
| 163 | OA; Sourwood 2½-3" Cal | **3** | EA | $750.00 | $2,250 |
| 164 | PA; London Plain Tree 3 - 3½" Cal | **24** | EA | $850.00 | $20,400 |
| 165 | QP; Pin Oak 3 - 3½" Cal | **7** | EA | $900.00 | $6,300 |
| 166 | QR; Red Oak 3 - 3½" Cal | **7** | EA | $950.00 | $6,650 |
| 167 | *Shrubs* | | | | |
| 168 | CA; Sweet Pepperbush 3½ - 4' HT | **28** | EA | $95.00 | $2,660 |
| 169 | HQ; Oak-leaf Hydrangea 3 - 3½' HT | **49** | EA | $95.00 | $4,655 |
| 170 | HV; Witch Hazel 7- 8' B+B | **3** | EA | $350.00 | $1,050 |
| 171 | IG; Compact Incberry 2½ - 3' HT | **33** | EA | $125.00 | $4,125 |
| 172 | IV; Winterberry 2 - 2½ HT | **61** | EA | $95.00 | $5,795 |
| 173 | JC; Common Juniper 24" SPD | **0** | EA | $75.00 | $0 |
| 174 | JH; Creeping Juniper 15-24" SPD | **68** | EA | $75.00 | $5,100 |
| 175 | JV; Eastern Red Cedar 7- 8' HT | **26** | EA | $205.00 | $5,330 |
| 176 | MG; Sweetgale 3½ - 4' HT | **38** | EA | $95.00 | $3,610 |
| 177 | PF; Pink Beauty Potentilla 24" SPD | **22** | EA | $75.00 | $1,650 |
| 178 | RA; Grow Low Sumac 2 - 2½' SPD | **47** | EA | $115.00 | $5,405 |
| 179 | RT; Staghorn Sumac 3 Gal | **13** | EA | $115.00 | $1,495 |
| 180 | RV; Virginia Rose 2½ - 3' SPD | **0** | EA | $75.00 | $0 |
| 181 | VA; Lowbush Blueberry 15-24" SPD | **53** | EA | $75.00 | $3,975 |
| 182 | VD; Arrowwood 4 - 4½' HT | **31** | EA | $150.00 | $4,650 |
| 183 | VT; Dwarf Cranberry Bush 3 - 3½' HT | **12** | EA | $115.00 | $1,380 |
| 184 | *Groundcover* | | | | |
| 185 | CP; Sweet Fern 1 Gal | **1,966** | EA | $15.00 | $29,490 |
| 186 | Grass at temporary parking area | **6,650** | SF | $0.35 | $2,328 |
| 187 | Maintenance of landscaping | **1** | LS | $10,000.00 | $10,000 |
| 188 | **G2050 Landscaping Total** | | | | **$862,545** |
| 189 | | | | | |
| 190 | ***G20 SITE IMPROVEMENTS TOTAL*** | | | | **$1,828,819** |
| 191 | | | | | |
| 192 | | | | | |

# Fuller Middle School

Framingham, MA
137,385 GSF

## SITEWORK: NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|---|
| 193 | **G30 SITE CIVIL/MECHANICAL UTILITIES** | | | | Early Bid package |
| 194 | | | | | |
| 195 | **G3010 Water Supply** | | | | |
| 196 | *33 10 00 Water Distribution* | | | | |
| 197 | 2" Domestic water service | **120** | LF | $60.00 | BP#1 |
| 198 | 6" Fire water service | **170** | LF | $70.00 | BP#1 |
| 199 | Water service; not sized | **680** | LF | $95.00 | BP#1 |
| 200 | Hydrant | **5** | EA | $4,500.00 | BP#1 |
| 201 | Miscellaneous gates, valves, etc. (gate valve 8x8x6) | **1** | LS | $10,000.00 | BP#1 |
| 202 | **G3010 Water Supply Total** | | | | **$0** |
| 203 | | | | | |
| 204 | **G3020 Sanitary Sewer** | | | | |
| 205 | *33 31 00 Sanitary Sewerage* | | | | |
| 206 | All incl. trench and backfill | | | | |
| 207 | 6" DI | **78** | LF | $70.00 | BP#1 |
| 208 | 6" PVC | **42** | LF | $70.00 | BP#1 |
| 209 | 8" PVC | **472** | LF | $75.00 | BP#1 |
| 210 | SMH; Sewer manhole | **4** | EA | $4,500.00 | BP#1 |
| 211 | CO; Cleanout | **1** | EA | $600.00 | BP#1 |
| 212 | Connect to existing | **1** | EA | $3,500.00 | BP#1 |
| 213 | Acid neutralization tank | **2** | EA | $7,500.00 | BP#1 |
| 214 | Grease trap | **1** | EA | $15,000.00 | BP#1 |
| 215 | **G3020 Sanitary Sewer Total** | | | | **$0** |
| 216 | | | | | |
| 217 | **G3030 Storm Sewer** | | | | |
| 218 | *33 41 00 Storm Utility Drainage* | | | | |
| 219 | All incl. trench and backfill | | | | |
| 220 | 6" PVC | **47** | LF | $35.00 | BP#1 |
| 221 | 12" HDPE | **2,435** | LF | $42.00 | BP#1 |
| 222 | 15" HDPE | **635** | LF | $45.00 | BP#1 |
| 223 | 18" HDPE | **548** | LF | $48.00 | BP#1 |
| 224 | 24" HDPE | **371** | LF | $50.00 | BP#1 |
| 225 | 30" HDPE | **547** | LF | $60.00 | BP#1 |
| 226 | DMH; Manhole | **9** | EA | $3,500.00 | BP#1 |
| 227 | CB; catch basin | **19** | EA | $4,500.00 | BP#1 |
| 228 | Temporary CB, convert to DMH | **3** | EA | $4,500.00 | BP#1 |
| 229 | Headwall @ 24" HDPE end | **2** | EA | $1,500.00 | BP#1 |
| 230 | *Allowances for:* | | | | BP#1 |
| 231 | Water quality structures | **4** | EA | $15,000.00 | BP#1 |
| 232 | Gravel and sod buffer for pretreatment | **1** | LS | $10,000.00 | BP#1 |
| 233 | Stormceptors: | | | | BP#1 |
| 234 | 450i | **2** | EA | $10,000.00 | BP#1 |

# Fuller Middle School

Framingham, MA
137,385 GSF

## SITEWORK: NEW CONSTRUCTION

| | DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|---|
| 235 | 3600 | 1 | EA | $35,000.00 | BP#1 |
| 236 | 6000 | 1 | EA | $60,000.00 | BP#1 |
| 237 | Outlet structure | 1 | EA | $5,000.00 | BP#1 |
| 238 | Perimeter drainage | | | | Bldg Tab |
| 239 | **G3030 Storm Sewer Total** | | | | **$0** |
| 240 | | | | | |
| 241 | **G3040 Heating Distribution** | | | | |
| 242 | *33 50 00 Gas Service* | | | | |
| 244 | Connection to existing gas main | | | | By Other |
| 245 | Gas line piping, incl's valves (2) | | | | By Other |
| 246 | **G3040 Heating Distribution Total** | | | | **$0** |
| 247 | | | | | |
| 248 | ***G30 SITE CIVIL/MECHANICAL UTILITIES TOTAL*** | | | | **$0** |
| 249 | | | | | |
| 250 | | | | | |
| 251 | ***G40 SITE ELECTRICAL UTILITIES*** | | | | |
| 252 | | | | | |
| 253 | **G4010 Site Electrical Utilities** | | | | |
| 253 | | | | | |
| 254 | *33 70 00 Electrical Utilities* | | | | |
| 255 | *Site Lighting, Site Eqpt* | | | | |
| 256 | Type SL1, 1-Fixt, 30' pole | 45 | EA | $4,767.40 | BP#1 |
| 257 | Type SL1A, 1-Fixt, 30' pole | 0 | EA | $4,767.40 | BP#1 |
| 258 | Type SL3, Wallpack | 4 | EA | $701.80 | $2,807 |
| 259 | Type SL3 Pedestrian Light Pole | 42 | EA | $3,242.80 | $136,198 |
| 260 | WP Signage w/ Lights, FBO | 1 | EA | $1,113.20 | $1,113 |
| 261 | Type SL10 Plant uplight | 12 | EA | $520.30 | $6,244 |
| 262 | Receptacle WP GFI | 5 | EA | $284.35 | $1,422 |
| 263 | CCTV Camera, Pole Mtd | 3 | EA | $1,863.40 | $5,590 |
| 264 | Elect Vehicle Charging Station | 3 | EA | $1,645.60 | $4,937 |
| 265 | Relocate Exist EM Call Box | 2 | EA | $1,113.20 | $2,226 |
| 266 | Time Clock | 1 | EA | $1,004.30 | $1,004 |
| 267 | | | | | |
| 268 | *Branch Circuitry:* | | | | |
| 269 | 3/4" Emt, 4#10 | 280 | LF | $14.98 | BP#1 |
| 270 | 1" PVC CDT UG | 7,110 | LF | $5.41 | BP#1 |
| 271 | 2" PVC CDT UG | 900 | LF | $7.70 | BP#1 |
| 272 | 2 1/2" PVC CDT UG | 3,600 | LF | $10.31 | BP#1 |
| 273 | 17x30x12" Site Pullbox | 16 | EA | $2,323.20 | $37,171 |
| 274 | Handhole | 6 | EA | $2,323.20 | $13,939 |
| 275 | #10 Wire | 12,400 | LF | $1.25 | $15,535 |
| 276 | #8 Wire | 16,050 | LF | $1.76 | $28,261 |
| 277 | #6 Wire | 2,700 | LF | $2.11 | $5,707 |

# *Fuller Middle School*

Framingham, MA
137,385 GSF

## *SITEWORK: NEW CONSTRUCTION*

| | *DESCRIPTION* | *QUANTITY* | *UNIT* | *UNIT COST* | *TOTAL* |
|---|---|---|---|---|---|
| 278 | Signal Cable | **1,250** | LF | $1.82 | $2,269 |
| 279 | | | | | |
| 280 | Site Power, EG Feeders, Utilities: | | | | |
| 282 | 4" PVC (Primary, empty) UG | **460** | LF | $16.95 | $7,797 |
| 283 | 4" PVC CDT, 4 600 Mcm, UG (service) | **600** | LF | $104.70 | $62,819 |
| 284 | 4" PVC CDT UG (spare) | **100** | LF | $16.95 | $1,695 |
| 285 | 4" PVC CDT, 4 500 Mcm, UG (EG) | **100** | LF | $87.18 | $8,718 |
| 286 | 2" PVC, 4#1/0 UG (EG) | **100** | LF | $29.19 | $2,919 |
| 287 | 2 1/2" PVC, 4#4/0 UG (EG) | **100** | LF | $38.87 | $3,887 |
| 288 | 1" PVC, EG Controls, Misc UG | **200** | LF | $10.44 | $2,088 |
| 281 | Utility Pole Riser | **1** | LF | $4,767.40 | $4,767 |
| 289 | Utility Transformer Pad | **1** | LS | $4,162.40 | $4,162 |
| 290 | Manhole | **2** | EA | $11,616.00 | $23,232 |
| 292 | Trenching, Concrete, Backfill | **1** | LS | $100,000.00 | BP#1 |
| 293 | | | | | |
| 294 | Miscellaneous: | | | | |
| 295 | 4" PVC CDT UG (Comm) | **800** | LF | $16.95 | $13,560 |
| 296 | Innerduct | **600** | LF | $3.99 | $2,396 |
| 297 | Tel Utility Pole Riser | **1** | LS | $3,121.80 | $3,122 |
| 298 | 3'x3' Comm Handhole | **1** | EA | $6,243.60 | $6,244 |
| 299 | | | | | |
| 300 | Misc Site Demo | **1** | LS | $10,890.00 | BP#1 |
| 301 | Site Security Lighting | **1** | LS | $12,584.00 | $12,584 |
| 302 | Temp Power and Lighting | **1** | LS | $31,460.00 | $31,460 |
| 303 | Eqpt Rentals | **1** | LS | $7,260.00 | $7,260 |
| 304 | **G4010 Site Electrical Utilities Total** | | | | **$463,132** |
| 305 | | | | | |
| 306 | ***G40 SITE ELECTRICAL UTILITIES TOTAL*** | | | | **$463,132** |
| 307 | | | | | |
| 308 | | | | **TOTAL SITEWORK SUMMARY** | **$2,564,406** |
| 309 | | | | | |

# *Fuller Middle School*

Fuller Middle School
137,385 GSF

## *MAIN SUMMARY - NEW CONSTRUCTION*

| ***DESCRIPTION*** | | | ***TOTAL*** | ***COST/SF*** |
|---|---|---|---|---|
| **Direct Trade Costs With Site** | | | | |
| New Construction | 137,385 | GSF | $42,156,411 | $306.85 |
| Site Development | | | $2,564,406 | $18.67 |
| **Direct Trade Cost SubTotal** | | | **$44,720,817** | **$325.51** |
| Demolish Existing Building | 195,400 | GSF | $1,465,500 | $10.67 |
| Hazardous Waste Abatement (Budget provided) | | | $1,294,490 | $9.42 |
| **Building Cost Subtotal** | | | **$47,480,807** | **$345.60** |
| Design and Pricing Contingency | 3.00% | $47,480,807 | $1,424,424 | $10.37 |
| **Building Cost Total** | | | **$48,905,231** | **$355.97** |
| Escal. to Midpoint of Construction (Consigli %) | 1.34% | $48,905,231 | $655,330 | $4.77 |
| **Trade Cost SubTotal** | | | **$49,560,561** | **$360.74** |
| General Conditions | | | $2,931,033 | $21.33 |
| General Requirements | | | $2,289,380 | $16.66 |
| SDI | | | $269,858 | $1.96 |
| Sub Bonds | | | $403,034 | $2.93 |
| General Liability Insurance | | | $576,109 | $4.19 |
| Construction Contingency | 2.50% | $49,560,561 | $1,239,014 | $9.02 |
| CM Fee | | | $1,152,218 | $8.39 |
| **BP#1** | | | $10,957,843 | $79.76 |
| **BP#2** | | | $8,738,800 | $63.61 |
| **BP#2 Savings** | | | ($182,955) | |
| **Estimated Construction Cost Total** | | | **$77,934,895** | **$567.27** |

# *Fuller Middle School*

Framingham, MA

## DIRECT TRADE COSTS SUMMARY - CSI

**137,385 GSF**

| *Element* | *Filed Sub Bid* | *SITEWORK* | *BUILDING* | *TOTAL* | *$/GSF* |
|---|---|---|---|---|---|
| 02 30 00 Building Demolition | | | | $0 | $0.00 |
| 02 41 00 Demolition | | $0 | | $0 | $0.00 |
| 02 60 00 Hazardous Waste Remediation | | | $0 | $0 | $0.00 |
| **02-EXISTING CONDITIONS** | | **$0** | **$0** | **$0** | **$0.00** |
| 03 30 00 Cast-In-Place Concrete | | | $111,548 | $111,548 | $0.81 |
| **03-CONCRETE** | | **$0** | **$111,548** | **$111,548** | **$0.81** |
| 04 20 00 Unit Masonry | *$2,456,979* | | $2,456,979 | $2,456,979 | $17.88 |
| **04-MASONRY** | | **$0** | **$2,456,979** | **$2,456,979** | **$17.88** |
| 05 12 00 Structural Steel Framing | | | $59,250 | $59,250 | $0.43 |
| 05 31 00 Steel Decking | | | $0 | $0 | $0.00 |
| 05 40 00 Cold-Formed Metal Framing | | | $0 | $0 | $0.00 |
| 05 50 00* Miscellaneous and Ornamental Iron | *$1,770,843* | | $1,770,843 | $1,770,843 | $12.89 |
| **05-METALS** | | **$0** | **$1,830,093** | **$1,830,093** | **$13.32** |
| 06 10 00 Rough Carpentry | | | $267,293 | $267,293 | $1.95 |
| 06 16 50 Gypsum Sheathing | | | $0 | $0 | $0.00 |
| 06 20 00 Finish Carpentry | | | $886,115 | $886,115 | $6.45 |
| 06 40 00 Architectural Woodwork | | | $88,675 | $88,675 | $0.65 |
| **06-WOOD, PLASTICS & COMPOSITES** | | | **$1,242,083** | **$1,242,083** | **$9.04** |
| 07 00 01* Waterproofing, Dampproofing & Caulking | *$36,576* | | $36,576 | $36,576 | $0.27 |
| 07 21 00 Thermal Insulation | | | $541,964 | $541,964 | $3.94 |
| 07 00 02* Roofing & Flashing | *$1,810,473* | | $1,810,473 | $1,810,473 | $13.18 |
| 07 42 00 Wall Panels | | | $1,251,774 | $1,251,774 | $9.11 |
| 07 81 00 Applied Fireproofing | | | $108,050 | $108,050 | $0.79 |
| 07 84 10 Penetration Firestopping | | | $178,601 | $178,601 | $1.30 |
| **07-THERMAL AND MOISTURE PROTECTION** | | | **$3,927,436** | **$3,927,436** | **$28.59** |
| 08 11 10 Hollow Metal Doors and Frames | | | $284,350 | $284,350 | $2.07 |
| 08 14 00 Flush Wood Doors | | | $10,000 | $10,000 | $0.07 |
| 08 31 10 Access Doors & Frames | | | $30,000 | $30,000 | $0.22 |
| 08 33 10 Overhead Coiling Doors | | | $50,433 | $50,433 | $0.37 |
| 08 00 01* Metal Windows | | | $2,142,316 | $2,142,316 | $15.59 |
| 08 63 00 Metal-Framed Skylights | | | $702,625 | $702,625 | $5.11 |
| 08 71 00 Door Hardware | | | $406,000 | $406,000 | $2.96 |
| 08 00 02* Glass and Glazing | *$1,694,255* | | $1,694,255 | $1,694,255 | $12.33 |
| 08 90 00 Louvers and Vents | | | $53,125 | $53,125 | $0.39 |
| **08-OPENINGS** | | | **$5,373,104** | **$5,373,104** | **$39.11** |
| 09 29 00 Gypsum Drywall | | | $3,433,769 | $3,433,769 | $24.99 |

# *Fuller Middle School*

Framingham, MA

## DIRECT TRADE COSTS SUMMARY - CSI

**137,385 GSF**

| *Element* | *Filed Sub Bid* | *SITEWORK* | *BUILDING* | *TOTAL* | *$/GSF* |
|---|---|---|---|---|---|
| 09 30 00* Tiling | *$42,625* | | $42,625 | $42,625 | $0.31 |
| 09 50 01* Acoustical Ceilings | *$755,811* | | $755,811 | $755,811 | $5.50 |
| 09 60 01* Resilient Flooring | *$924,199* | | $924,199 | $924,199 | $6.73 |
| 09 64 00 Wood Flooring | | | $48,495 | $48,495 | $0.35 |
| 09 64 40 Wood Athletic Flooring | | | $210,125 | $210,125 | $1.53 |
| 09 67 23 Resinous Flooring | | | $119,100 | $119,100 | $0.87 |
| 09 68 00 Carpeting | | | $33,240 | $33,240 | $0.24 |
| 09 72 00 Wall Coverings | | | $421,019 | $421,019 | $3.06 |
| 09 91 00* Painting | *$549,947* | | $549,947 | $549,947 | $4.00 |
| **09-FINISHES** | | | **$6,538,330** | **$6,538,330** | **$47.59** |
| 10 00 01 Specialties | | | $489,600 | $489,600 | $3.56 |
| 10 11 00 Visual Display Boards | | | $396,784 | $396,784 | $2.89 |
| 10 14 23 Signage | | | $86,373 | $86,373 | $0.63 |
| 10 21 13 Plastic Toilet Compartments | | | $59,600 | $59,600 | $0.43 |
| 10 21 23 Cubicle Curtains, Tracks & Hardware | | | $400 | $400 | $0.00 |
| 10 26 00 Wall Protection | | | $10,000 | $10,000 | $0.07 |
| 10 28 13 Toilet Accessories | | | $23,880 | $23,880 | $0.17 |
| 10 44 13 Fire Protection SpeciaLSies | | | $7,982 | $7,982 | $0.06 |
| 10 51 24 Phenolic-Core Lockers | | | $296,975 | $296,975 | $2.16 |
| **10-SPECIALTIES** | | | **$1,371,594** | **$1,371,594** | **$9.98** |
| 11 00 00 Equipment | | | $35,000 | $35,000 | $0.25 |
| 11 31 00 Appliances | | | $10,900 | $10,900 | $0.08 |
| 11 40 00 Food Service Equipment | | | $415,270 | $415,270 | $3.02 |
| 11 52 13 Projection Screens | | | $23,000 | $23,000 | $0.17 |
| 11 61 00 Theater and Stage Equipment | | | $953,366 | $953,366 | $6.94 |
| 11 66 23 Gymnasium Equipment | | | $103,412 | $103,412 | $0.75 |
| 11 66 53 Gymnasium Dividers | | | $20,000 | $20,000 | $0.15 |
| 11 66 80 Scoreboards | | | $7,500 | $7,500 | $0.05 |
| **11-EQUIPMENT** | | | **$1,568,448** | **$1,568,448** | **$11.42** |
| 12 24 12 Roller Shades | | | $138,714 | $138,714 | $1.01 |
| 12 35 53 Caswork | | | $909,605 | $909,605 | $6.62 |
| 12 48 13 Entrance Mats & Frames | | | $13,860 | $13,860 | $0.10 |
| 12 66 00 Telescoping Stands | | | $76,000 | $76,000 | $0.55 |
| **12-FURNISHING** | | | **$1,138,179** | **$1,138,179** | **$8.28** |
| 13 00 00 Special Construction | | | $0 | $0 | $0.00 |
| **13-SPECIAL CONSTRUCTION** | | | **$0** | **$0** | **$0.00** |
| 14 24 00* Hydraulic Elevators | *$205,000* | | $205,000 | $205,000 | $1.49 |
| **14-CONVEYING EQUIPMENT** | | | **$205,000** | **$205,000** | **$1.49** |

# *Fuller Middle School*

Framingham, MA

## DIRECT TRADE COSTS SUMMARY - CSI

**137,385 GSF**

| *Element* | *Filed Sub Bid* | *SITEWORK* | *BUILDING* | *TOTAL* | *$/GSF* |
|---|---|---|---|---|---|
| 21 00 00* Fire Protection | *$863,994* | | $863,994 | $863,994 | $6.29 |
| 22 00 00* Plumbing | *$2,126,673* | | $2,126,673 | $2,126,673 | $15.48 |
| 23 00 00* HVAC | *$7,879,869* | | $7,879,869 | $7,879,869 | $57.36 |
| **21 - 23-MECHANICAL** | | | **$10,870,536** | **$10,870,536** | **$79.12** |
| 26 00 00* Electrical | *$5,986,215* | $463,132 | $5,523,083 | $5,986,215 | $40.20 |
| **26,27,28-ELECTRICAL, COMMUNICATION, SECURITY** | | **$463,132** | **$5,523,083** | **$5,986,215** | **$40.20** |
| 31 00 00 Earthwork | | $272,455 | $0 | $272,455 | $1.98 |
| 31 10 00 Site Clearing | | $0 | | $0 | $0.00 |
| 31 23 19 Dewatering and Drainage | | $0 | | $0 | $0.00 |
| 31 25 00 Erosion and Sedimentation Controls | | $0 | | $0 | $0.00 |
| **31-EARTHWORK** | | **$272,455** | **$0** | **$272,455** | **$0.00** |
| 32 12 00 Flexible Paving | | $0 | | $0 | $0.00 |
| 32 13 10 Rigid Paving | | $0 | | $0 | $0.00 |
| 32 14 00 Unit Paving | | $154,035 | | $154,035 | $1.12 |
| 32 16 00 Curbs and Gutters | | $0 | | $0 | $0.00 |
| 32 17 00 Paving Specialties | | $40,495 | | $40,495 | $0.29 |
| 32 30 00 Site Improvements | | $569,844 | | $569,844 | $4.15 |
| 32 31 00 Fences and Gates | | $201,900 | | $201,900 | $1.47 |
| 32 32 00 Retaining Walls | | $0 | | $0 | $0.00 |
| 32 80 00 Irrigation | | $0 | | $0 | $0.00 |
| 32 92 00 Turfs and Grasses | | $668,947 | | $668,947 | $4.87 |
| 32 93 00 Plants | | $193,598 | | $193,598 | $1.41 |
| **32-EXTERIOR IMPROVEMENTS** | | **$1,828,819** | | **$1,828,819** | **$13.31** |
| 33 10 00 Water Distribution | | $0 | | $0 | $0.00 |
| 33 31 00 Sanitary Sewerage | | $0 | | $0 | $0.00 |
| 33 41 00 Storm Utility Drainage | | $0 | | $0 | $0.00 |
| 33 50 00 Gas Service | | $0 | | $0 | $0.00 |
| **33-UTILITIES** | | **$0** | | **$0** | **$0.00** |
| **Direct Trade Costs Subtotal** | ***$27,103,458*** | **$2,564,406** | **$42,156,411** | **$44,720,817** | **$325.51** |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 10 | **02-EXISTING CONDITIONS** | | | | |
| 11 | | | | | |
| 12 | **02 60 00 Hazardous Waste Remediation** | | | | |
| 13 | Removal and disposal of hazardous materials | | | | Main Summary |
| 14 | **02 60 00 Hazardous Waste RemediationTotal** | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | **03-CONCRETE** | | | | |
| 18 | | | | | |
| 19 | **03 30 00 Cast-In-Place Concrete** | | | | |
| 20 | A1010 FOUNDATIONS | | | | |
| 21 | Concrete | | | | |
| 22 | Continuous footings; 3' x 1' 0" typ. | **2,049** | LF | | |
| 23 | 4' x 1' 0" | | | | |
| 24 | 5' x 1' 0" | | | | |
| 25 | Concrete; material | **247** | CY | $135.00 | BP#2 |
| 26 | Concrete; place (combination of pumping/trucking) | **247** | CY | $95.00 | BP#2 |
| 27 | Reinforcement w/ftn wall dowels (10#/lf) | **20,490** | LB | $1.15 | BP#2 |
| 28 | Formwork | **8,196** | SF | $12.00 | BP#2 |
| 29 | Spread footings | **133** | EA | | |
| 30 | Concrete; material | **465** | CY | $135.00 | BP#2 |
| 31 | Concrete; place | **465** | CY | $95.00 | BP#2 |
| 32 | Reinforcement (100#/cy) | **46,500** | LB | $1.15 | BP#2 |
| 33 | Formwork | **6,406** | SF | $12.00 | BP#2 |
| 34 | Pilasters | **133** | EA | $1,100.00 | BP#2 |
| 35 | Grade beam GB-1, GB-2 | **288** | LF | | |
| 36 | Concrete; material | **57** | CY | $135.00 | BP#2 |
| 37 | Concrete; place (combination of pumping/trucking) | **57** | CY | $95.00 | BP#2 |
| 38 | Reinforcement (125#/cy) | **7,125** | LB | $1.15 | BP#2 |
| 39 | Formwork | **1,940** | SF | $12.00 | BP#2 |
| 40 | Foundation and frost walls; 16" thick x 4' 0" high typ. | **8,551** | SF | | |
| 41 | Concrete; material | **443** | CY | $135.00 | BP#2 |
| 42 | Concrete; place | **443** | CY | $95.00 | BP#2 |
| 43 | Reinforcement (150#/cy) | **66,450** | LB | $1.15 | BP#2 |
| 44 | Formwork | **17,212** | SF | $8.00 | BP#2 |
| 45 | Foundation walls; 21" thick x 4' 0" high typ. | **1,645** | SF | | |
| 46 | Concrete; material | **112** | CY | $135.00 | BP#2 |
| 47 | Concrete; place | **112** | CY | $95.00 | BP#2 |
| 48 | Reinforcement (150#/cy) | **16,800** | LB | $1.15 | BP#2 |
| 49 | Formwork | **3,289** | SF | $8.00 | BP#2 |
| 50 | Brick shelf | **2,049** | LF | $5.00 | BP#2 |
| 51 | Elevator pit; slab and walls | **1** | EA | $5,000.00 | BP#2 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 52 | Anchor bolts | **532** | SET | $35.00 | BP#2 |
| 53 | 6" Ø hole through wall, backfill w/crushed stone | **4** | EA | $500.00 | BP#2 |
| 54 | | | | | |
| 55 | Bandshell | | | | |
| 56 | Footing | **46** | lf | | |
| 57 | Concrete; material | **7** | CY | $135.00 | BP#2 |
| 58 | Concrete; place | **7** | CY | $95.00 | BP#2 |
| 59 | Reinforing | **455** | LBS | $1.15 | BP#2 |
| 60 | Formwork | **96** | SF | $9.00 | BP#2 |
| 61 | Wall | **182** | sf | | |
| 62 | Concrete | **10** | CY | $135.00 | BP#2 |
| 63 | Placing | **10** | CY | $95.00 | BP#2 |
| 64 | Reinforing | **1,500** | LBS | $1.15 | BP#2 |
| 65 | Formwork | **382** | SF | $8.00 | BP#2 |
| 66 | Concrete steps | **556** | LFR | $150.00 | BP#2 |
| 67 | Concrete steps , amphitheatre steps | **385** | LFR | $125.00 | BP#2 |
| 68 | Miscellaneous concrete | | | | |
| 69 | Ground improvements | | | | BP#1 |
| 70 | | | | | |
| 71 | Special Foundation Conditions | | | | |
| 72 | Dewatering during excavation | | | | BP#1 |
| 73 | | | | | |
| 74 | Thermal & Moisture Protection | | | | |
| 75 | 2" rigid insulation at foundation walls | **10,195** | SF | $2.50 | $25,488 |
| 76 | | | | | |
| 77 | | | | | |
| 78 | | | | | |
| 79 | *A1030 SLAB ON GRADE* | | | | |
| 80 | *Concrete* | | | | |
| 81 | *Slab on grade, 5" thick, WWF, top of slab 314' 0"* | **66,213** | SF | | |
| 82 | *Concrete; material* | **1,030** | CY | $135.00 | BP#2 |
| 83 | *Concrete; place & finish* | **66,213** | SF | $2.85 | BP#2 |
| 84 | *Reinforcement (6x6 mesh)* | **76,145** | SF | $1.00 | BP#2 |
| 85 | *Slab depressions* | **1,243** | LF | $65.00 | BP#2 |
| 86 | *Slab thickening at stair 5'x2'x1' deep* | **6** | LOC | $2,500.00 | BP#2 |
| 87 | *Slab on grade at loading dock, 6" thick, #4 bars* | **350** | SF | | |
| 88 | *Concrete; material* | **6** | CY | $135.00 | BP#2 |
| 89 | *Concrete; place & finish* | **350** | SF | $2.85 | BP#2 |
| 90 | *Reinforcement; #4@12"bew* | **469** | LBS | $1.45 | BP#2 |
| 91 | *Miscellaneous* | | | | |
| 92 | *Concrete ramp @ Auditorium* | **2,440** | SF | $18.00 | BP#2 |
| 93 | *Sloped walkway @ Cohort/Learning Common/Stage* | **320** | SF | $20.00 | BP#2 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 94 | *Housekeeping & mechanical equipment pads* | **1** | LS | $5,000.00 | BP#2 |
| 95 | *Miscellaneous concrete* | **1** | LS | | BP#2 |
| 96 | | | | | |
| 97 | *Thermal & Moisture Protection* | | | | |
| 98 | *2" rigid insulation to perimeter of slab* | **6,392** | SF | $2.65 | BP#2 |
| 99 | *Vapor retarder under slab* | **76,145** | SF | $1.00 | BP#2 |
| 100 | | | | | |
| 101 | B1010 UPPER FLOOR CONSTRUCTION | | | | |
| 102 | Concrete | | | | |
| 103 | Slab on deck topping, 3¼" light weight, WWF | **69,572** | SF | | |
| 104 | Concrete; material | **966** | CY | $135.00 | BP#2 |
| 105 | Reinforcement (6x6 mesh) | **76,529** | SF | $1.00 | BP#2 |
| 106 | Rebar at corners and openings | **3,826** | LBS | $1.15 | BP#2 |
| 107 | Concrete; place & finish | **69,572** | SF | $5.00 | BP#2 |
| 108 | Beam pocket | **23** | EA | $750.00 | BP#2 |
| 109 | | | | | |
| 110 | Concrete | | | | |
| 111 | Slab on deck topping, 3¼" light weight, WWF | **1,600** | SF | | |
| 112 | Concrete; material | **22** | CY | $135.00 | BP#2 |
| 113 | Reinforcement (6x6 mesh) | **1,760** | SF | $1.00 | BP#2 |
| 114 | Rebar at corners and openings | **88** | LBS | $1.15 | BP#2 |
| 115 | Concrete; place & finish | **1,600** | SF | $5.00 | BP#2 |
| 116 | | | | | |
| 117 | Miscellaneous | | | | |
| 118 | Sand blasted cast in place concrete walls | **1** | LS | $50,000.00 | $50,000 |
| 119 | Precast concrete at planter w/galv steel connection & cross bracin | **212** | SF | $75.00 | $15,900 |
| 120 | slab on grade power troweled concrete at seats | **2,240** | SF | $9.00 | $20,160 |
| 121 | | | | | |
| 122 | PC; power troweled concrete @ Makerspace, Auditorium, AV | **2,018** | SF | $9.00 | BP#2 |
| 123 | | | | | |
| 124 | **03 30 00 Cast-In-Place Concrete Total** | | | | **$111,548** |
| 125 | | | | | |
| 126 | | | | | |
| 127 | **04-MASONRY** | | | | |
| 128 | | | | | |
| 129 | **04 20 00 Unit Masonry** | | | | |
| 130 | 12" CMU wall reinforced; Gym & Auditorium, double hgt | **7,942** | SF | $32.00 | $254,144 |
| 131 | 8" CMU wall, load bearing wall @ Auditorium | **1,284** | SF | $24.00 | $30,816 |
| 132 | Stairs/elevator CMU wall | **3,266** | SF | $24.00 | $78,384 |
| 133 | | | | | |
| 134 | Exterior brick wall; scored brick veneer, "modular" 8x8x4 , and "ut | **17,333** | SF | $35.00 | $606,655 |
| 135 | Exterior CMU wall; scored ground face CMU, 8x12x16 , 4x8x16, an | **24,140** | SF | $36.00 | $869,040 |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 136 | 12" Reinforced ground face CMU wall backup @ Auditorium & Gyı | **14,805** | SF | $28.00 | $414,540 |
| 137 | | | | | |
| 138 | 4" Utility brick, both sides @ parapet wall, Main Entrance | **175** | SF | $32.00 | $5,600 |
| 139 | Precast colored coping on top of parapet wall | **26** | LF | $150.00 | $3,900 |
| 140 | Premium for custom brick and CMU @ lintels & shelves | **1,128** | LF | $50.00 | $56,400 |
| 141 | Precast planter | **50** | LF | $750.00 | $37,500 |
| 142 | | | | | |
| 143 | Exterior mockup | **1** | LS | $50,000.00 | $50,000 |
| 144 | Temporary enclosures | **1** | LS | $50,000.00 | $50,000 |
| 145 | **04 20 00 Unit Masonry Total** | | | | **$2,456,979** |
| 146 | | | | | |
| 147 | | | | | |
| 148 | **05-METALS** | | | | |
| 149 | | | | | |
| 150 | **05 12 00 Structural Steel Framing** | | | | |
| 151 | Structural Steel Framing | **793** | TNS | | |
| 152 | Steel floor framing | | | | |
| 153 | Wide flange beams | **243** | TNS | $3,700.00 | BP#2 |
| 154 | Wide flange beams > 100 | **36** | TNS | $3,950.00 | BP#2 |
| 155 | HSS-shapes | **47** | TNS | $4,150.00 | BP#2 |
| 156 | W-shapes ; columns | **14** | TNS | $3,950.00 | BP#2 |
| 157 | HSS-shapes; columns | **101** | TNS | $4,150.00 | BP#2 |
| 158 | HSS brace frames | **40** | TNS | $4,250.00 | BP#2 |
| 159 | Remainder of steel framing; beams, columns, bridging | **26** | TNS | $4,150.00 | BP#2 |
| 160 | Plates, bent plates and angles | **133** | EA | $75.00 | BP#2 |
| 161 | Moment connections | **157** | EA | $750.00 | BP#2 |
| 162 | Shear studs | **10,170** | EA | $5.50 | BP#2 |
| 163 | 3" deep x 18ga galv composite floor deck | **71,172** | SF | $4.25 | BP#2 |
| 164 | | | | | |
| 165 | Structural steel roof framing | **286** | TNS | | |
| 166 | Wide flange beams | **124** | TNS | $3,650.00 | BP#2 |
| 167 | Wide flange beams > 100 | **87** | TNS | $3,900.00 | BP#2 |
| 168 | HSS-shape | **18** | TNS | $4,100.00 | BP#2 |
| 169 | Support post HSS7.625x0.375; RTU screen | **2** | TNS | $4,100.00 | BP#2 |
| 170 | L- ledger; L4x4x1/4 anchored to CMU, roof | **1** | TNS | $3,550.00 | BP#2 |
| 171 | Roof steel framing incl's hanger support beam, 52DLH17, HSS trus | **42** | TNS | $4,100.00 | BP#2 |
| 172 | Add reinforcement 7#/sf hot dip galv steel @ RTU | **12** | TNS | $4,100.00 | BP#2 |
| 173 | Moment connections | **241** | EA | $750.00 | BP#2 |
| 174 | Roof hanger @ main roof | **47** | EA | $1,500.00 | BP#2 |
| 175 | 3/4" rod hanger @ Gym and Auditorium roof | **11** | EA | $1,500.00 | BP#2 |
| 176 | Other misc plates, connections | **65,518** | SF | $4.50 | BP#2 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 177 | Premium for galv steel framing | **14** | TNS | $500.00 | BP#2 |
| 178 | 3" deep x 18ga galv comp roof deck (w/conc topping) | **40,338** | SF | $4.25 | BP#2 |
| 179 | R3; 3" 18 ga roof deck above Learning Commons | **8,610** | SF | $4.25 | BP#2 |
| 180 | R3C; 3" Cellular 18/16 ga roof deck, galv at Auditorium | **7,615** | SF | $4.25 | BP#2 |
| 181 | R1.5; 1.5" 20 ga roof deck, Gym equipment storage | **835** | SF | $6.00 | BP#2 |
| 182 | R1.5A; 1.5" Cellular acoustic 20 ga roof deck, galv at Gym | **8,120** | SF | $6.50 | BP#2 |
| 183 | | | | | |
| 184 | Roof screen, galv; HSS shapes | **15** | TNS | $3,950.00 | $59,250 |
| 185 | **05 12 00 Structural Steel Framing Total** | | | | **$59,250** |
| 186 | | | | | |
| 187 | **05 31 00 Steel Decking** | | | | |
| 188 | With Structural Steel | | | | |
| 189 | **05 31 00 Steel Decking Total** | | | | |
| 190 | | | | | |
| 191 | **05 40 00 Cold-Formed Metal Framing** | | | | |
| 192 | Light gage metal framing | | | | Div 09 |
| 193 | **05 40 00 Cold-Formed Metal Framing Total** | | | | |
| 194 | | | | | |
| 195 | **05 50 00* Miscellaneous and Ornamental Iron** | | | | |
| 196 | Interior guardrails | | | | |
| 197 | Handrailing | **150** | LF | $200.00 | $30,000 |
| 198 | Guardrail in Common areas | **365** | LF | $103.00 | $37,595 |
| 199 | Guardrails at lockers | **1,000** | LF | $550.00 | BP#2 |
| 200 | Railings in auditorium | **1** | LS | $35,000.00 | $35,000 |
| 201 | Vertical duct enclosure | **4,200** | LF | $90.00 | NIC |
| 202 | | | | | |
| 203 | Miscellaneous metals | | | | |
| 204 | Furnishings; miscellaneous metals | **137,385** | GSF | $0.35 | $48,085 |
| 205 | | | | | |
| 206 | Elevator pit ladder | **1** | EA | $1,500.00 | $1,500 |
| 207 | Elevator vent | **1** | EA | $1,200.00 | $1,200 |
| 208 | Sill angles | **4** | EA | $175.00 | $700 |
| 209 | Hoist beam | **1** | EA | $5,000.00 | $5,000 |
| 210 | | | | | |
| 211 | Interior stairs | | | | |
| 212 | Egress stairs | **6** | FLT | $25,000.00 | $150,000 |
| 213 | Monumental/open stairs #4 & #5 | | | | BP#2 |
| 214 | Monumental/open stairs #3 | **1** | FLT | $65,000.00 | $65,000 |
| 215 | | | | | |
| 216 | Stair finishes | | | | |
| 217 | Railings | **1** | LS | $150,000.00 | $150,000 |
| 218 | | | | | |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 219 | Miscellaneous metals for fittings | **137,385** | GSF | $1.25 | $171,731 |
| 220 | Misc metals for interior construction | **137,385** | GSF | $1.25 | $171,731 |
| 222 | Roof dunnage (SS) | **7** | TNS | $7,500.00 | $52,500 |
| 223 | | | | | |
| 224 | Galvanized bar grating | **1,000** | SF | $55.00 | $55,000 |
| 225 | Roof soffit/fascia framing | **500** | LF | $165.00 | $82,500 |
| 226 | | | | | |
| 227 | Cont galv relieving angle at masonry wall | **1,038** | LF | $100.00 | $103,800 |
| 228 | Loose lintel @ exterior wall openings | **90** | LF | $200.00 | $18,000 |
| 229 | Miscellaneous metals in exterior closure | **57,520** | SF | $1.50 | $86,280 |
| 230 | | | | | |
| 231 | Through wall sheet metal flashing | **1,424** | LF | $25.00 | $35,600 |
| 232 | Corrugated perforated metal; mechanical RTU screen | **1,678** | SF | $60.00 | $100,680 |
| 233 | | | | | |
| 234 | Operable partition framing support beam | **633** | LF | $175.00 | $110,775 |
| 235 | Monumental/open stairs | **920** | LFR | $85.00 | $78,200 |
| 236 | | | | | |
| 237 | Metal trim detail | **12,630** | LF | $8.00 | $101,040 |
| 238 | | | | | |
| 239 | Metal trim detail | **375** | LF | $5.00 | $1,875 |
| 240 | **05 50 00* Miscellaneous and Ornamental Iron Total** | | | | **$1,770,843** |
| 241 | | | | | |
| 242 | | | | | |
| 243 | **06-WOOD, PLASTICS & COMPOSITES** | | | | |
| 244 | | | | | |
| 245 | **06 10 00 Rough Carpentry** | | | | |
| 246 | Furnishings; miscellaneous wood blocking | **137,385** | GSF | $0.25 | $34,346 |
| 247 | Blocking at doors | **5,406** | LF | $2.50 | $13,515 |
| 248 | Door Installation | **318** | EA | $150.00 | $47,700 |
| 249 | Rough carpentry internal partitions and ceilings | **137,385** | GSF | $1.25 | $171,731 |
| 250 | **06 10 00 Rough Carpentry Total** | | | | **$267,293** |
| 251 | | | | | |
| 252 | **06 16 50 Gypsum Sheathing** | | | | |
| 253 | Inclueded | | | | |
| 254 | **06 16 50 Gypsum Sheathing Total** | | | | |
| 255 | | | | | |
| 256 | **06 20 00 Finish Carpentry** | | | | |
| 257 | Window stools - Solid surfacing material | **1,250** | LF | $50.00 | $62,500 |
| 258 | Toilets | | | | |
| 259 | Vanity counter; Toilets | **319** | LF | $200.00 | $63,800 |
| 260 | Vanity counter; Dressing | **33** | LF | $200.00 | $6,600 |
| 261 | Folding panel shutter w/w/magnetic writable surfice both sides & | **40** | EA | $1,000.00 | $40,000 |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 262 | | | | | |
| 263 | Auditorium walls: | | | | |
| 264 | Plam wall panel to auditorium | **2,900** | SF | $42.00 | $121,800 |
| 265 | FRP; fiber reinforced panels in Kitchen | **1,921** | SF | $15.00 | $28,815 |
| 266 | | | | | |
| 267 | Solid epoxy backsplash | **650** | SF | $18.00 | $11,700 |
| 268 | | | | | |
| 269 | Exposed column covers; allowance | **1** | LS | $35,000.00 | $35,000 |
| 270 | P.lam panel wall cover | **330** | SF | $25.00 | $8,250 |
| 271 | | | | | |
| 272 | Plam bumper w/HD wood marker tray | **2,915** | LF | $90.00 | $262,350 |
| 273 | Maple rail | **1,600** | LF | $30.00 | $48,000 |
| 274 | | | | | |
| 275 | Cafeteria fixed sound absorbing panel, wood fiber; allow | **2,000** | SF | $25.00 | $50,000 |
| 276 | Wall panels at auditorium | **1,500** | SF | $85.00 | $127,500 |
| 277 | Wall epoxy | **1,100** | SF | $18.00 | $19,800 |
| 278 | **06 20 00 Finish Carpentry Total** | | | | **$886,115** |
| 279 | | | | | |
| 280 | **06 40 00 Architectural Woodwork** | | | | |
| 281 | Perforated arch grille curved @ Classrooms 1' h | **1,345** | LF | $55.00 | $73,975 |
| 282 | Wood cantelevered benches at classroom glazed partitions | **42** | EA | $350.00 | $14,700 |
| 283 | **06 40 00 Architectural Woodwork Total** | | | | **$88,675** |
| 284 | | | | | |
| 285 | | | | | |
| 286 | **07-THERMAL AND MOISTURE PROTECTION** | | | | |
| 287 | | | | | |
| 288 | **07 00 01* Waterproofing, Dampproofing & Caulking** | | | | |
| 289 | ***07 11 00 Bituminous Dampproofing*** | | | | |
| 290 | ***07 13 00 Self-Adhering Waterproofing*** | | | | |
| 291 | ***07 16 00 Cementitious Waterproofing*** | | | | |
| 292 | ***07 27 00 Air Barrier*** | | | | |
| 293 | ***07 92 00 Joint Sealants*** | | | | |
| 294 | Caulking and sealants at corrugated metal panel | **4,578** | SF | $0.65 | $2,976 |
| 295 | Caulking and sealants at composite metal panel | **3,638** | SF | $0.65 | $2,365 |
| 296 | Caulking and sealants at Trespa cladding | **6,581** | SF | $0.65 | $4,278 |
| 297 | Caulking and sealants at brick & CMU | **41,473** | SF | $0.65 | $26,957 |
| 298 | Waterproofing elevator pit | **225** | SF | $18.00 | BP#2 |
| 299 | Damp proofing to foundation walls | **10,195** | SF | $4.50 | BP#2 |
| 300 | **07 00 01* Waterproofing, Dampproofing & Caulking Total** | | | | **$36,576** |
| 301 | | | | | |
| 302 | **07 21 00 Thermal Insulation** | | | | |
| 303 | **07 26 00 Vapor Retarder** | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 304 | 3" Faced rigid cellular polyiso insulation | **17,333** | SF | $4.00 | $69,332 |
| 305 | Fluid applied air vapor barrier | **17,333** | SF | $5.50 | $95,332 |
| 306 | | | | | |
| 307 | 3" Faced rigid cellular polyiso insulation | **24,140** | SF | $4.00 | $96,560 |
| 308 | Fluid applied air vapor barrier | **24,140** | SF | $5.50 | $132,770 |
| 309 | | | | | |
| 310 | 4" Mineral fiber insulation | **4,578** | SF | $4.50 | $20,601 |
| 311 | Fluid applied air vapor barrier | **4,578** | SF | $5.50 | $25,179 |
| 312 | | | | | |
| 313 | 4" Mineral fiber insulation | **3,638** | SF | $4.50 | $16,371 |
| 314 | Fluid applied air vapor barrier | **3,638** | SF | $5.50 | $20,009 |
| 315 | | | | | |
| 316 | 4" Mineral fiber insulation at Trespa cladding - | **6,581** | SF | $4.50 | $29,615 |
| 317 | Fluid applied air vapor barrier | **6,581** | SF | $5.50 | $36,196 |
| 318 | **07 21 00 Thermal Insulation Total** | | | | **$541,964** |
| 319 | | | | | |
| 320 | **07 00 02* Roofing & Flashing** | | | | |
| 321 | ***07 54 00 Thermoplastic Membrane Roofing*** | | | | |
| 322 | ***07 62 00 Sheet Metal Flashing and Trim*** | | | | |
| 323 | ***07 72 00 Roof Accessories*** | | | | |
| 324 | Single-ply PVC membrane roofing system | **65,518** | SF | | |
| 325 | Type 1; Main roof, lower roof | **36,386** | SF | $13.50 | $491,211 |
| 326 | Type 2; Gym | **8,955** | SF | $13.50 | $120,893 |
| 327 | Type 3; Raised roof above Learning Commons | **8,610** | SF | $13.50 | $116,235 |
| 328 | Type 4; Entry walkway & Terrace | **1,216** | SF | $13.50 | $16,409 |
| 329 | Type 5; Auditorium | **7,615** | SF | $13.50 | $102,803 |
| 330 | Vertical roof membrane, 5'-6" h at raised roof | **2,736** | SF | $14.50 | $39,672 |
| 331 | ½" roof cover board | **65,518** | SF | $2.25 | $147,414 |
| 332 | 6" insulation | **65,518** | SF | $2.50 | $163,794 |
| 333 | Vapor retarder | **65,518** | SF | $1.50 | $98,276 |
| 334 | Add ½"fire rated roof board @ Auditorium, Gym & raised roof are | **17,565** | SF | $2.75 | $48,304 |
| 335 | Add 2 layers ½"fiber cement roof board @ Auditorium | **7,615** | SF | $5.00 | $38,075 |
| 336 | Add acoustic insulation in flutes @ Auditorium & Gym roof deck | **16,570** | SF | $1.50 | $24,855 |
| 337 | Precast concrete pavers over adjustable deck pedestal system @ rc | **1,216** | SF | $45.00 | $54,698 |
| 338 | Polycarbonate entrance canopy | **420** | SF | $185.00 | $77,700 |
| 339 | Prefinished aluminum fascia/roof edge | **3,054** | LF | $65.00 | $198,510 |
| 340 | Roof expansion joint | **1** | AL | $25,000.00 | $25,000 |
| 341 | | | | | |
| 342 | Roofing Accessories | | | | |
| 343 | Miscellaneous roof accessories | **1** | LS | $22,000.00 | $22,000 |
| 344 | Roof hatch | **2** | EA | $3,000.00 | $6,000 |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 345 | Paver walkway | **745** | SF | $25.00 | $18,625 |
| 346 | **07 00 02* Roofing & Flashing Total** | | | | **$1,810,473** |
| 347 | | | | | |
| 348 | **07 42 00 Wall Panels** | | | | |
| 349 | **07 42 10 Aluminum Composite Metal Panels** | | | | |
| 350 | Corrugated metal panel w/exposed fasteners | **4,578** | SF | $60.00 | $274,680 |
| 351 | 5" Fiberglass thermal Z-furring | **4,578** | SF | $3.50 | $16,023 |
| 352 | | | | | |
| 353 | Composite metal panel w/exposed fasteners | **3,638** | SF | $75.00 | $272,850 |
| 354 | 5" Fiberglass thermal Z-furring | **3,638** | SF | $3.50 | $12,733 |
| 355 | | | | | |
| 356 | Wood grain phenolic panel - Trespa @ ext wall incl's projections/v | **6,581** | SF | $82.00 | $539,642 |
| 357 | 5" Fiberglass thermal Z-furring | **6,581** | SF | $3.50 | $23,034 |
| 358 | | | | | |
| 359 | Phenolic panel; Ext soffit at projection/window bay | **1,250** | SF | $82.00 | $102,500 |
| 360 | Furring | **1,250** | SF | $4.25 | $5,313 |
| 361 | 4" mineral fiber insulation at Trespa cladding - Exterior soffit | **1,250** | SF | $4.00 | $5,000 |
| 362 | **07 42 00 Wall Panels Total** | | | | **$1,251,774** |
| 363 | | | | | |
| 364 | **07 81 00 Applied Fireproofing** | | | | |
| 365 | 1 hr spray fireproofing @ raised roof area over Learning Commons | **8,610** | SF | $5.00 | $43,050 |
| 366 | Intumescent fireproofing | **1** | LS | $65,000.00 | $65,000 |
| 367 | **07 81 00 Applied Fireproofing Total** | | | | **$108,050** |
| 368 | | | | | |
| 369 | **07 84 10 Penetration Firestopping** | | | | |
| 370 | Firestopping | **137,385** | GSF | $0.30 | $41,216 |
| 371 | Interior penetration firestopping | | | | |
| 372 | Top-of-partition firestopping | **137,385** | GSF | $1.00 | $137,385 |
| 373 | **07 84 10 Penetration Firestopping Total** | | | | **$178,601** |
| 374 | | | | | |
| 375 | | | | | |
| 376 | **08-OPENINGS** | | | | |
| 377 | | | | | |
| 378 | **08 11 10 Hollow Metal Doors and Frames** | | | | |
| 379 | *Security gate 7'-0" x 7'-10", steel @ 1st Floor Corridors* | **2** | EA | $975.00 | $1,950 |
| 380 | *Hollow Metal Doors:* | | | | |
| 381 | *type B1, single* | **41** | EA | $325.00 | $13,325 |
| 382 | *type B2, pair* | **6** | EA | $650.00 | $3,900 |
| 383 | *HM frames* | **260** | EA | $225.00 | $58,500 |
| 384 | *HM frames for pair doors* | **29** | EA | $275.00 | $7,975 |
| 385 | *Wood Doors:* | | | | |
| 386 | *type B1, single, wood* | **91** | EA | $325.00 | $29,575 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 387 | *same as above w/applied surface both sides* | **13** | EA | $775.00 | $10,075 |
| 388 | *type B1, 5'-0" x 26'-0" swinging panel @ AV rooms* | **2** | EA | $25,000.00 | $50,000 |
| 389 | *type B2, pair, wood* | **13** | EA | $650.00 | $8,450 |
| 390 | *type C1, single, wood w/full height glass* | **111** | EA | $400.00 | $44,400 |
| 391 | *type C2, pair, w/full height glass* | **9** | EA | $800.00 | $7,200 |
| 392 | *type C3, pair, w/vision panel 0'-5" x 6'-0"* | **1** | EA | $800.00 | $800 |
| 393 | | | | | |
| 394 | Exterior HM doors; complete | **45** | LEAF | | |
| 395 | Type A, single | **1** | LEAF | $1,800.00 | $1,800 |
| 396 | Type B1, single | **5** | LEAF | $1,800.00 | $9,000 |
| 397 | Type B2, pair | **9** | PR | $3,600.00 | $32,400 |
| 398 | Type B2, 10'-0" x 8'-6" @ Receiving | **1** | PR | $5,000.00 | $5,000 |
| 399 | **08 11 10 Hollow Metal Doors and Frames Total** | | | | **$284,350** |
| 400 | | | | | |
| 401 | **08 14 00 Flush Wood Doors** | | | | |
| 402 | **08 34 70 Interior Sound Control Door Assemblies** | | | | |
| 403 | *Premium cost for acoustical doors* | **40** | LOC | $250.00 | $10,000 |
| 404 | **08 14 00 Flush Wood Doors Total** | | | | **$10,000** |
| 405 | | | | | |
| 406 | **08 31 10 Access Doors & Frames** | | | | |
| 407 | Access doors | **100** | EA | $300.00 | $30,000 |
| 408 | **08 31 10 Access Doors & Frames Total** | | | | **$30,000** |
| 409 | | | | | |
| 410 | **08 33 10 Overhead Coiling Doors** | | | | |
| 411 | **08 33 10 Overhead Coiling Grilles** | | | | |
| 412 | *Coiling drapery, security screen* | | | | |
| 413 | *Cafeteria/Learning Commons; 21'-0" x 8'-0" (2 ea)* | **336** | SF | $55.00 | $18,480 |
| 414 | *Kitchen; 40'-0" x 8'-0" (1 ea)* | **320** | SF | $55.00 | $17,600 |
| 415 | *Admin area; 21'-0" x 5'-6" (1 ea)* | **116** | SF | $55.00 | $6,353 |
| 416 | | | | | |
| 417 | *OH door, 12'-0" x 10'-6" motor operated @ Makerspace* | **1** | EA | $8,000.00 | $8,000 |
| 418 | **08 33 10 Overhead Coiling Doors Total** | | | | **$50,433** |
| 419 | | | | | |
| 420 | **08 00 01* Metal Windows** | | | | |
| 421 | **08 41 10 Aluminum-Framed Entrances and Storefronts** | | | | |
| 422 | **08 44 10 Glazed Aluminum Curtain Walls** | | | | |
| 423 | **08 45 23 Fiberglass-Sandwich-Panel Assemblies** | | | | |
| 424 | **08 51 10 Aluminum Windows** | | | | |
| 425 | Aluminum entry doors including hardware | **17** | LEAF | | |
| 426 | Type SF1, single | **7** | LEAF | $3,500.00 | $24,500 |
| 427 | Type SF2, pair | **5** | PR | $7,000.00 | $35,000 |
| 428 | School guard premium | **5** | LVS | $10,000.00 | $50,000 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 429 | | | | | |
| 430 | | | | | |
| 431 | Aluminum-Framed Entrances and Storefronts, interior | | | | |
| 432 | type SF1, single, aluminum/glass | **3** | EA | $2,500.00 | $7,500 |
| 433 | type SF2, pair, aluminum/glass | **2** | PR | $5,000.00 | $10,000 |
| 434 | School guard doors, premium | **5** | LVS | $10,000.00 | $50,000 |
| 435 | | | | | |
| 436 | Aluminum storefronts, double glazed w/security insul glazing, sch | **919** | SF | | |
| 437 | Type 10A; 24'-8 1/4" x 12'-0" | **1** | EA | $34,300.00 | $34,300 |
| 438 | Type 11A; 9'-6 1/4" x 12'-0" | **1** | EA | $13,200.00 | $13,200 |
| 439 | Type 12A; 9'-7 1/2" x 12'-0" | **2** | EA | $11,600.00 | $23,200 |
| 440 | Type 13A; 7'-6" x 12'-0" | **1** | EA | $10,400.00 | $10,400 |
| 441 | Type 16A; 12'-0" x 13'-0 1/2" | **1** | EA | $17,900.00 | $17,900 |
| 442 | Bay windows | **2,912** | SF | | |
| 443 | Type 1; 9'-3" x 12'-0" | **10** | EA | $13,300.00 | $133,000 |
| 444 | Type 2; 9'-3" x 12'-0" | **11** | EA | $13,300.00 | $146,300 |
| 445 | Type 2A; 9'-3" x 11'-0 1/4" | **2** | EA | $12,700.00 | $25,400 |
| 446 | Type 3; 9'-3" x 11'-6" | **9** | EA | $12,700.00 | $114,300 |
| 447 | Type 3C; 7'-0" x 12'-0" | **1** | EA | $10,100.00 | $10,100 |
| 448 | Curtain wall/Windows | **8,799** | SF | | |
| 449 | Type 4; 3'-0" x 10'-1" | **57** | EA | $3,500.00 | $199,500 |
| 450 | Type 5A; 3'-11" x 12'-0" | **6** | EA | $5,800.00 | $34,800 |
| 451 | Type 5B; 3'-11" x 11'-6" | **22** | EA | $5,800.00 | $127,600 |
| 452 | Type A1; 1'-4" x 3'-0" | **1** | EA | $500.00 | $500 |
| 453 | Type A2; 2'-0" x 4'-0" | **1** | EA | $1,000.00 | $1,000 |
| 454 | Type A3; 2'-0" x 12'-0" | **27** | EA | $2,600.00 | $70,200 |
| 455 | Type B1; 3'-4" x 12'-0" | **10** | EA | $4,400.00 | $44,000 |
| 456 | Type B1A; 3'-4" x 5'-10" | **2** | EA | $1,800.00 | $3,600 |
| 457 | Type B3; 3'-4" x 7'-0" | **1** | EA | $2,800.00 | $2,800 |
| 458 | Type B4; 3'-4" x 12'-0" | **9** | EA | $4,400.00 | $39,600 |
| 459 | Type C1; 3'-4" x 12'-0" | **14** | EA | $4,400.00 | $61,600 |
| 460 | Type D1; 5'-4" x 6'-2" | **2** | EA | $3,900.00 | $7,800 |
| 461 | Type D3; 5'-4" x 12'-0" | **12** | EA | $7,000.00 | $84,000 |
| 462 | Type E1; 5'-4" x 10'-0" | **3** | EA | $7,000.00 | $21,000 |
| 463 | Type E2; 5'-4" x 12'-0" | **6** | EA | $7,000.00 | $42,000 |
| 464 | Type F1; 7'-4" x 6'-2" | **1** | EA | $5,400.00 | $5,400 |
| 465 | Type F2; 7'-4" x 10'-0" | **3** | EA | $9,200.00 | $27,600 |
| 466 | Type F3; 7'-4" x 12'-0" | **7** | EA | $9,600.00 | $67,200 |
| 467 | Type G1; 7'-4" x 12'-0" | **11** | EA | $9,600.00 | $105,600 |
| 468 | Type H1; 9'-4" x 6'-0" | **1** | EA | $7,000.00 | $7,000 |
| 469 | Type H2; 9'-4" x 10'-0" | **1** | EA | $12,200.00 | $12,200 |
| 470 | Type H3; 9'-4" x 12'-0" | **1** | EA | $14,000.00 | $14,000 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 471 | Type I1; 9'-4" x 6'-0" | **1** | EA | $7,000.00 | $7,000 |
| 472 | Type I2; 9'-4" x 10'-0" | **1** | EA | $12,200.00 | $12,200 |
| 473 | Type I3; 9'-4" x 12'-0" | **1** | EA | $12,200.00 | $12,200 |
| 474 | Type K1; 11'-4" x 12'-0" | **2** | EA | $17,000.00 | $34,000 |
| 475 | Type L1; 13'-4" x 12'-0" | **1** | EA | $17,500.00 | $17,500 |
| 476 | Type M1; 10'-4" x 6'-2" | **1** | EA | $8,000.00 | $8,000 |
| 477 | Type N1; 6'-4" x 4'-4" | **2** | EA | $3,400.00 | $6,800 |
| 478 | Type N2; 6'-4" x 5'-10" | **2** | EA | $4,400.00 | $8,800 |
| 479 | Type O1; 6'-4" x 12'-0" | **2** | EA | $9,500.00 | $19,000 |
| 480 | Type Q1; 4'-4" x 7'-0" | **1** | EA | $3,600.00 | $3,600 |
| 481 | Type R1; 3'-4" x 6'-11" irregular shape | **1** | EA | $2,900.00 | $2,900 |
| 482 | Horizontal aluminum sun shades attached to CW/windows @ sout | **1,755** | LF | $175.00 | NIC |
| 483 | Blocking for openings | **7,906** | LF | $8.00 | $63,248 |
| 484 | Window caulking | **7,906** | LF | $3.00 | $23,718 |
| 485 | Add premium cost for translucent | **360** | SF | $25.00 | $9,000 |
| 486 | Allow for premium cost for security glazing | **614** | SF | $375.00 | $230,250 |
| 487 | **08 00 01* Metal Windows Total** | | | | **$2,142,316** |
| 488 | | | | | |
| 489 | **08 63 00 Metal-Framed Skylights** | | | | |
| 490 | Glazed aluminum-framed skylight | **4,015** | SF | $175.00 | $702,625 |
| 491 | **08 63 00 Metal-Framed Skylights Total** | | | | **$702,625** |
| 492 | | | | | |
| 493 | **08 71 00 Door Hardware** | | | | |
| 494 | *Interior:* | | | | |
| 495 | Hardware | **318** | SET | $750.00 | $238,500 |
| 496 | Powered door openers | **4** | LOC | $3,500.00 | $14,000 |
| 497 | CR; Card reader | **15** | EA | $3,000.00 | $45,000 |
| 498 | RDL; Remote door un/lock | **14** | EA | $3,000.00 | $42,000 |
| 499 | | | | | |
| 500 | Exterior: | | | | |
| 501 | Card reader | **3** | EA | $3,500.00 | $10,500 |
| 502 | RDL; Remote door un/lock | **16** | EA | $3,500.00 | $56,000 |
| 503 | **08 71 00 Door Hardware Total** | | | | **$406,000** |
| 504 | | | | | |
| 505 | **08 00 02* Glass and Glazing** | | | | |
| 506 | **08 80 00 Glazing** | | | | |
| 507 | Door sidelights | **900** | SF | $55.00 | $49,500 |
| 508 | Glazing to doors | **1,554** | SF | $55.00 | $85,470 |
| 509 | | | | | |
| 510 | Interior windows | | | | |
| 511 | Interior | **5,215** | SF | $55.00 | $286,825 |
| 512 | Glazed film | **4,332** | SF | $60.00 | $259,920 |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 513 | Ballistic glass sliding window @ Admin | **1** | EA | $2,500.00 | $2,500 |
| 514 | Mirror frameless | **1,454** | SF | $45.00 | $65,430 |
| 515 | Graduated glass;  premium | **2,359** | SF | $65.00 | $153,335 |
| 516 | Acoustical glass premium | **505** | SF | $300.00 | $151,500 |
| 517 | Interior storefront | | | | |
| 518 | Storefront @ vestibule | **3,115** | SF | $85.00 | $264,775 |
| 519 | Breakout Space-A, B & C; Glazed partition/wood panel closure | **3** | EA | $125,000.00 | $375,000 |
| 520 | **08 00 02* Glass and Glazing Total** | | | | **$1,694,255** |
| 521 | | | | | |
| 522 | **08 90 00 Louvers and Vents** | | | | |
| 523 | Metal louver | **625** | SF | $85.00 | $53,125 |
| 524 | **08 90 00 Louvers and Vents Total** | | | | **$53,125** |
| 525 | | | | | |
| 526 | | | | | |
| 527 | **09-FINISHES** | | | | |
| 528 | | | | | |
| 529 | **09 29 00 Gypsum Drywall** | | | | |
| 530 | Gypsum board partitions | **114,616** | SF | | |
| 531 | Type B3; 3 5/8" metal stud, 5/8" GWB | **203** | SF | $7.20 | $1,462 |
| 532 | Type B4; same as type B3, add  batt insulation | **5,145** | SF | $8.70 | $44,762 |
| 533 | Type C2; 3 5/8" metal stud, 2x 5/8" GWB | **5,600** | SF | $9.40 | $52,640 |
| 534 | Type C3; 3 5/8" metal stud, 2x 5/8" GWB, batt insulation | **6,483** | SF | $10.90 | $70,665 |
| 535 | Type C4; same as type C3, add 1hr fire rated | **3,165** | SF | $11.40 | $36,081 |
| 536 | Type C6; 6" metal stud, 2x 5/8" GWB, batt insulation | **2,468** | SF | $12.90 | $31,837 |
| 537 | Type C7; same as type C6, add 1hr fire rated | **5,507** | SF | $13.40 | $73,794 |
| 538 | Type C8; 8" metal stud, 2x 5/8" GWB, batt insulation | **172** | SF | $14.90 | $2,563 |
| 539 | Type C10; 10" metal stud, 2x 5/8" GWB, batt insulation | **222** | SF | $16.90 | $3,752 |
| 540 | Type D3; 3 5/8" metal stud, 2x 5/8" GWB, batt insulation | **1,526** | SF | $10.90 | $16,633 |
| 541 | Type D6; 6" metal stud, 2x 5/8" GWB, batt insulation | **1,266** | SF | $12.90 | $16,331 |
| 542 | Type E3; 3 5/8" metal stud, 3x 5/8" GWB, batt insulation | **23,327** | SF | $13.10 | $305,584 |
| 543 | Type E4; same as type E3, add 1hr fire rated | **780** | SF | $13.60 | $10,608 |
| 544 | Type E6; 6" metal stud, 3x 5/8" GWB, batt insulation | **1,158** | SF | $15.30 | $17,717 |
| 545 | Type E7; 10" metal stud, 3x 5/8" GWB, batt insulation | **1,022** | SF | $19.30 | $19,725 |
| 546 | Type E8; 8" metal stud, 3x 5/8" GWB, batt insulation | **18,060** | SF | $17.30 | $312,438 |
| 547 | Type E9; same as type E8, add 1hr fire rated | **2,710** | SF | $17.80 | $48,238 |
| 548 | Type F1; 3 5/8" metal stud, 4x 5/8" GWB, batt insulation | **4,988** | SF | $15.30 | $76,316 |
| 549 | Type F2; same as type F1, add 1hr fire rated | **1,834** | SF | $15.80 | $28,977 |
| 550 | Type F6; 6" metal stud, 4x 5/8" GWB, batt insulation | **9,646** | SF | $17.30 | $166,876 |
| 551 | Type F7; 8" metal stud, 4x 5/8" GWB, batt insulation | **227** | SF | $19.30 | $4,381 |
| 552 | Type F8; same as type F7, add 1hr fire rated | **1,065** | SF | $19.80 | $21,087 |
| 553 | Type H4; 4" metal C-H stud, 3x 5/8" GWB, batt insulation, 2hr rate | **67** | SF | $15.10 | $1,012 |
| 554 | Type H6; 6" metal C-H stud, 3x 5/8" GWB, batt insulation, 2hr rate | **1,561** | SF | $17.10 | $26,693 |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 555 | Type J1; 2 x (3 5/8" metal stud, 5/8" GWB, batt insulation) | **6,552** | SF | $17.40 | $114,005 |
| 556 | Type J2; same as type J1 | **1,157** | SF | $17.40 | $20,132 |
| 557 | Type K1; 2 x (3 5/8" metal stud, 2x5/8" GWB, batt insulation) | **6,245** | SF | $21.80 | $136,141 |
| 558 | Type K2; same as typeK1, add 1hr fire rated | **2,460** | SF | $22.30 | $54,858 |
| 559 | High Impact GWB premium | **51,577** | SF | $1.00 | $51,577 |
| 560 | | | | | |
| 561 | ½" Fiberglass faced gypsum sheathing | **26,668** | SF | $2.00 | $53,336 |
| 562 | 10" Cold formed metal framing | **26,668** | SF | $12.00 | $320,016 |
| 563 | ⅝" GWB interior of exterior wall | **26,668** | SF | $2.50 | $66,670 |
| 564 | | | | | |
| 565 | ½" Fiberglass faced gypsum sheathing | **4,578** | SF | $2.00 | $9,156 |
| 566 | 10" Cold formed metal framing | **4,578** | SF | $12.00 | $54,936 |
| 567 | ⅝" GWB interior of exterior wall | **4,578** | SF | $2.50 | $11,445 |
| 568 | | | | | |
| 569 | ½" Fiberglass faced gypsum sheathing | **3,638** | SF | $2.00 | $7,276 |
| 570 | 10" Cold formed metal framing | **3,638** | SF | $12.00 | $43,656 |
| 571 | ⅝" GWB interior of exterior wall | **3,638** | SF | $2.50 | $9,095 |
| 572 | | | | | |
| 573 | ½" Fiberglass faced gypsum sheathing | **6,581** | SF | $2.00 | $13,162 |
| 574 | 10" Cold formed metal framing | **6,581** | SF | $12.00 | $78,972 |
| 575 | ⅝" GWB interior of exterior wall | **6,581** | SF | $2.50 | $16,453 |
| 576 | | | | | |
| 577 | 1/2" sheathing at Trespa cladding - Exterior soffit | **1,250** | SF | $2.00 | $2,500 |
| 578 | 6" Metal stud at Trespa cladding - Exterior soffit | **1,250** | SF | $9.50 | $11,875 |
| 579 | 5/8 GWB at Trespa cladding - Exterior soffit | **1,250** | SF | $2.50 | $3,125 |
| 580 | | | | | |
| 581 | GWB soffit, light cove | **1,320** | LF | $35.00 | $46,200 |
| 582 | GWB ceiling/soffit in classrooms | **16,127** | SF | $32.00 | $516,064 |
| 583 | Sloped GWB soffit @ Art. | **175** | SF | $18.00 | $3,150 |
| 584 | Suspended plam clouds | **4,950** | SF | $55.00 | $272,250 |
| 585 | Gym ceiling; suspended lay in pre painted tegular edge tectum plar | **2,101** | SF | $15.00 | $31,519 |
| 586 | B1; GWB ceiling @ Atrium | **6,402** | SF | $15.00 | $96,030 |
| 587 | **09 29 00 Gypsum Drywall Total** | | | | **$3,433,769** |
| 588 | | | | | |
| 589 | **09 30 00* Tiling** | | | | |
| 590 | Quarry tile at Kitchen | **1,705** | SF | $25.00 | $42,625 |
| 591 | **09 30 00* Tiling Total** | | | | **$42,625** |
| 592 | | | | | |
| 593 | **09 50 01* Acoustical Ceilings** | | | | |
| 594 | ***09 51 10 Cementitious Wood Fiber Ceiling Panel*** | | | | |
| 595 | ***09 51 13 Acoustical Panel Ceilings*** | | | | |
| 596 | ***09 51 33 Metal Ceiling System*** | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 597 | ACT ceilings at Corridors, Public, Admin areas, Teacher Pl | **50,004** | SF | $5.00 | $250,020 |
| 598 | ACT ceiling, washable in kitchen | **1,705** | SF | $5.25 | $8,951 |
| 599 | Circulation Corridors ceiling | **13,581** | SF | $32.00 | $434,592 |
| 600 | A1; ACT - MR ceiling at Toilets | **6,869** | SF | $5.75 | $39,498 |
| 601 | Lay in ACT ceiling at band/chorus | **4,550** | SF | $5.00 | $22,750 |
| 602 | **09 50 01* Acoustical Ceilings Total** | | | | **$755,811** |
| 603 | | | | | |
| 604 | **09 60 01* Resilient Flooring** | | | | |
| 605 | ***09 65 00 Resilient Floor Tile*** | | | | |
| 606 | ***09 65 13 Resilient Wall Base & Accessories*** | | | | |
| 607 | ***09 65 66 Resilient Athletic Flooring*** | | | | |
| 608 | Linoleum treads & risers with rubber nosing | **828** | LFR | $15.50 | $12,834 |
| 609 | Linoleum tile at landings | **1,717** | SF | $8.00 | $13,736 |
| 610 | Acoustic underlayment under resilient flooring | **52,962** | SF | $2.75 | $145,646 |
| 611 | LT; Linoleum tile flooring, 13" x 13" | **93,064** | SF | $7.00 | $651,448 |
| 612 | LP; Plank linoleum flooring | **1,100** | SF | $10.00 | $11,000 |
| 613 | | | | | |
| 614 | Linoleum base | **12,630** | LF | $7.00 | $88,410 |
| 615 | | | | | |
| 616 | Vented rubber wall base | **375** | LF | $3.00 | $1,125 |
| 617 | **09 60 01* Resilient Flooring Total** | | | | **$924,199** |
| 618 | | | | | |
| 619 | **09 64 00 Wood Flooring** | | | | |
| 620 | Stage wood flooring: 4" hardboard assembly- recessed: | **1,590** | SF | $30.50 | $48,495 |
| 621 | 1/4" double tempered smooth both sides hardboard | | | | |
| 622 | (2) layers 3/4" plywood on sleepers with insulation | | | | |
| 623 | **09 64 00 Wood Flooring Total** | | | | **$48,495** |
| 624 | | | | | |
| 625 | **09 64 40 Wood Athletic Flooring** | | | | |
| 626 | Wood athletic flooring at Gym | **8,405** | SF | $25.00 | $210,125 |
| 627 | **09 64 40 Wood Athletic Flooring Total** | | | | **$210,125** |
| 628 | | | | | |
| 629 | **09 67 23 Resinous Flooring** | | | | |
| 630 | EP; epoxy flooring at Toilets | **7,940** | SF | $15.00 | $119,100 |
| 631 | **09 67 23 Resinous Flooring Total** | | | | **$119,100** |
| 632 | | | | | |
| 633 | **09 68 00 Carpeting** | | | | |
| 634 | carpet at aisles | **2,770** | SF | $12.00 | $33,240 |
| 635 | **09 68 00 Carpeting Total** | | | | **$33,240** |
| 636 | | | | | |
| 637 | **09 72 00 Wall Coverings** | | | | |
| 638 | *over curved gwb partition at curved wall* | **3,156** | SF | $27.50 | $86,790 |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 639 | *Fabric wrapped acoustic wall panels @ Music areas* | **1,443** | SF | $22.00 | $31,746 |
| 640 | *sloped fabric wrapped acoustic panel* | **8,359** | SF | $24.50 | $204,796 |
| 641 | *Cementitious wood fiber acoustical wall panel @ Gym* | **6,255** | SF | $15.00 | $93,825 |
| 642 | *Mural panorama wall cover; angeled @ Media, Admin Install* | **1,575** | SF | $1.50 | $2,363 |
| 643 | *Wall pads with cutout for MEH units; allow* | **1** | AL | $1,500.00 | $1,500 |
| 644 | **09 72 00 Wall Coverings Total** | | | | **$421,019** |
| 645 | | | | | |
| 646 | **09 91 00* Painting** | | | | |
| 647 | Painting | | | | |
| 648 | SC; sealed concrete at back of house | **3,288** | SF | $1.75 | $5,754 |
| 649 | E1; Exposed deck, painted @ Classrooms | **24,380** | SF | $1.50 | $36,570 |
| 650 | *Gym exposed deck, painted* | **8,405** | SF | $2.00 | $16,810 |
| 651 | *Paint* | **137,385** | GSF | $0.75 | $103,039 |
| 652 | *Paint GWB ceilings w/high performance coating at Toilets* | **30,893** | SF | $1.10 | $33,983 |
| 653 | *Auditorium ceiling; painted exposed metal deck* | **6,600** | SF | $2.50 | $16,500 |
| 654 | *Epoxy paint wainscot @ Locker/Toilet* | **8,234** | SF | $2.00 | $16,468 |
| 655 | *Paint CMU wall* | **12,492** | SF | $1.10 | $13,741 |
| 656 | *Paint drywall partitions* | **273,034** | SF | $0.95 | $259,382 |
| 657 | *Paint door frames* | **318** | EA | $85.00 | $27,030 |
| 658 | *Paint door* | **318** | EA | $65.00 | $20,670 |
| 659 | **09 91 00* Painting Total** | | | | **$549,947** |
| 660 | | | | | |
| 661 | | | | | |
| 662 | **10-SPECIALTIES** | | | | |
| 663 | | | | | |
| 664 | | | | | |
| 665 | **10 00 01 Specialties** | | | | |
| 666 | Operable partitions | **5,440** | SF | $90.00 | $489,600 |
| 667 | **10 00 01 Specialties Total** | | | | **$489,600** |
| 668 | | | | | |
| 669 | **10 11 00 Visual Display Boards** | | | | |
| 670 | *Tackboards* | **2,688** | SF | $18.00 | $48,384 |
| 671 | *Markerboards* | **5,376** | SF | $25.00 | $134,400 |
| 672 | *Tackable wall; allow* | **3,000** | SF | $18.00 | $54,000 |
| 673 | | | | | |
| 674 | *Academic areas:* | | | | |
| 675 | *Magnetic writing surface* | **6,400** | SF | $25.00 | $160,000 |
| 676 | **10 11 00 Visual Display Boards Total** | | | | **$396,784** |
| 677 | | | | | |
| 678 | **10 14 23 Signage** | | | | |
| 679 | Signage | | | | |
| 680 | Commerative plaque | **2** | LOC | $1,500.00 | $3,000 |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 681 | Dimensional characters; School name | **1** | AL | $5,000.00 | $5,000 |
| 682 | Plastic panel signs for room identification, way finding, hazard identification | **1** | AL | $7,500.00 | $7,500 |
| 683 | Framed paper signs | **1** | AL | $2,180.00 | $2,180 |
| 684 | Miscellaneous signage | **137,385** | GSF | $0.50 | $68,693 |
| 685 | **10 14 23 Signage Total** | | | | **$86,373** |
| 686 | | | | | |
| 687 | **10 21 13 Plastic Toilet Compartments** | | | | |
| 688 | Toilet compartments (plastic laminate) | | | | |
| 689 | Toilet compartments | **20** | EA | $1,200.00 | $24,000 |
| 690 | Toilet compartments - ADA | **14** | EA | $1,400.00 | $19,600 |
| 691 | Urinal screen | **20** | EA | $800.00 | $16,000 |
| 692 | **10 21 13 Plastic Toilet Compartments Total** | | | | **$59,600** |
| 693 | | | | | |
| 694 | **10 21 23 Cubicle Curtains, Tracks & Hardware** | | | | |
| 695 | Curtain track, carriers and curtains | **2** | EA | $200.00 | $400 |
| 696 | **10 21 23 Cubicle Curtains, Tracks & Hardware Total** | | | | **$400** |
| 697 | | | | | |
| 698 | **10 26 00 Wall Protection** | | | | |
| 699 | Wall & corner guards | | | | |
| 700 | Stainless steel corner guards | **1** | LS | $10,000.00 | $10,000 |
| 701 | **10 26 00 Wall Protection Total** | | | | **$10,000** |
| 702 | | | | | |
| 703 | **10 28 13 Toilet Accessories** | | | | |
| 704 | Toilet accessories | | | | |
| 705 | Combination PTD/WR unit | **8** | EA | $150.00 | $1,200 |
| 706 | Towel dispenser/waste receptacle | **45** | EA | $100.00 | $4,500 |
| 707 | Soap dispensers | **45** | EA | $35.00 | $1,575 |
| 708 | Toilet paper dispensers | **48** | EA | $65.00 | $3,120 |
| 709 | Sanitary napkin disposal units | **21** | EA | $250.00 | $5,250 |
| 710 | Robe hook | **15** | EA | $25.00 | $375 |
| 711 | Fold-down shower seat | **1** | EA | $200.00 | $200 |
| 712 | Grab bars | **28** | PR | $160.00 | $4,480 |
| 713 | Mirrors - in private bathrooms | **14** | EA | $150.00 | $2,100 |
| 714 | Mop holder w/shelf (Janitors) | **6** | EA | $180.00 | $1,080 |
| 715 | **10 28 13 Toilet Accessories Total** | | | | **$23,880** |
| 716 | | | | | |
| 717 | **10 44 13 Fire Protection SpeciaLSies** | | | | |
| 718 | Fire extinguisher cabinets | | | | |
| 719 | Fully recessed/non-rated | **14** | EA | $450.00 | $6,182 |
| 720 | Semi-recessed/non-rated | **6** | EA | $300.00 | $1,800 |
| 721 | **10 44 13 Fire Protection SpeciaLSies Total** | | | | **$7,982** |
| 722 | | | | | |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 723 | **10 51 24 Phenolic-Core Lockers** | | | | |
| 724 | Lockers | | | | |
| 725 | Athletic / PE lockers: metal 2-tier 30”h. x 15”w x 15”d | **50** | EA | $250.00 | $12,500 |
| 726 | Kitchen staff lockers, single tier, 12" x 12" x 6' high | **6** | EA | $250.00 | $1,500 |
| 727 | Student lockers 15"x12"x36" w/angled top, phenolic w/plam finisl | **660** | EA | $385.00 | $254,100 |
| 728 | Angles at lockers | **825** | LF | $35.00 | $28,875 |
| 729 | **10 51 24 Phenolic-Core Lockers Total** | | | | **$296,975** |
| 730 | | | | | |
| 731 | | | | | |
| 732 | **11-EQUIPMENT** | | | | |
| 733 | | | | | |
| 734 | **11 00 00 Equipment** | | | | |
| 735 | Shop equipment | **1** | LS | $25,000.00 | $25,000 |
| 736 | Loading dock equipment | **1** | LS | $10,000.00 | $10,000 |
| 737 | **11 00 00 Equipment Total** | | | | **$35,000** |
| 738 | | | | | |
| 739 | **11 31 00 Appliances** | | | | |
| 740 | Residential Appliances | | | | |
| 741 | Refrigerator/Freezer, microwave oven | **5** | RMS | $1,700.00 | $8,500 |
| 742 | Dishwasher | **1** | EA | $1,200.00 | $1,200 |
| 743 | Undercounter refrigerator @ Nurse | **1** | EA | $1,200.00 | $1,200 |
| 744 | **11 31 00 Appliances Total** | | | | **$10,900** |
| 745 | | | | | |
| 746 | **11 40 00 Food Service Equipment** | | | | |
| 747 | Food service equipment | | | | |
| 748 | Dining & Food Service (Budget provided, July 19, 2019) | **1** | AL | $415,270.00 | $415,270 |
| 749 | **11 40 00 Food Service Equipment Total** | | | | **$415,270** |
| 750 | | | | | |
| 751 | **11 52 13 Projection Screens** | | | | |
| 752 | Projection Screens | | | | |
| 753 | Motorized projection screen; Auditorium | **1** | EA | $17,000.00 | $17,000 |
| 754 | Projection screen - Media Center, room 1250 | **2** | EA | $3,000.00 | $6,000 |
| 755 | **11 52 13 Projection Screens Total** | | | | **$23,000** |
| 756 | | | | | |
| 757 | **11 61 00 Theater and Stage Equipment** | | | | |
| 758 | Auditorium/Theatre Equipment | | | | |
| 759 | AV | **1** | AL | $200,000.00 | $200,000 |
| 760 | Lighting | **1** | AL | $129,018.00 | $129,018 |
| 761 | Dimming | **1** | AL | $95,749.00 | $95,749 |
| 762 | Rigging | **1** | AL | $158,300.00 | $158,300 |
| 763 | Curtains | **1** | AL | $33,854.00 | $33,854 |
| 764 | Orchestra | **1** | AL | $175,000.00 | FF&E |

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 765 | Gym AV sound system | **1** | AL | $120,000.00 | $120,000 |
| 766 | Cafeteria AV | **1** | AL | $50,000.00 | $50,000 |
| 767 | Band and chorus AV | **1** | AL | $60,000.00 | $60,000 |
| 768 | Aud. seating; stacked (48), fixed (321), removeable (46) | **1** | AL | $106,445.00 | $106,445 |
| 769 | **11 61 00 Theater and Stage Equipment Total** | | | | **$953,366** |
| 770 | | | | | |
| 771 | **11 66 23 Gymnasium Equipment** | | | | |
| 772 | Gymnasium equipment | | | | |
| 773 | Shot clock/shot timer | **1** | EA | $1,250.00 | $1,250 |
| 774 | Pull up bar | **1** | EA | $850.00 | $850 |
| 775 | Stall bar | **1** | EA | $850.00 | $850 |
| 776 | Vertical ladder | **1** | EA | $550.00 | $550 |
| 777 | Rope hoist | **1** | EA | $500.00 | $500 |
| 778 | Overhead mounted folding backstops w/glass backboards | **6** | EA | $6,500.00 | $39,000 |
| 779 | Sleeves & floor plates for badminton & volleyball uprights; allow | **2** | SETS | $4,000.00 | $8,000 |
| 780 | Gym equipment controls-power touch | **1** | LS | $5,000.00 | $5,000 |
| 781 | Gym wall safety pads to be 8'-8" high | **2,634** | SF | $18.00 | $47,412 |
| 782 | **11 66 23 Gymnasium Equipment Total** | | | | **$103,412** |
| 783 | | | | | |
| 784 | **11 66 53 Gymnasium Dividers** | | | | |
| 785 | Gym motorized divider curtains | **1** | EA | $20,000.00 | $20,000 |
| 786 | **11 66 53 Gymnasium Dividers Total** | | | | **$20,000** |
| 787 | | | | | |
| 788 | **11 66 80 Scoreboards** | | | | |
| 789 | Electronic scoreboard | **1** | EA | $7,500.00 | $7,500 |
| 790 | **11 66 80 Scoreboards Total** | | | | **$7,500** |
| 791 | | | | | |
| 792 | | | | | |
| 793 | **12-FURNISHING** | | | | |
| 794 | | | | | |
| 795 | **12 24 12 Roller Shades** | | | | |
| 796 | Window treatment, manually operated roller shades | **10,288** | SF | $6.00 | $61,728 |
| 797 | motorized roller shades @ exterior CW and SF | **1,456** | SF | $10.00 | $14,560 |
| 798 | motorized shade units at skylights | **4,015** | SF | $10.00 | $40,150 |
| 799 | roller shade at interior doors w/lites & glazed partitions | **5,569** | SF | $4.00 | $22,276 |
| 800 | **12 24 12 Roller Shades Total** | | | | **$138,714** |
| 801 | | | | | |
| 802 | **12 35 53 Caswork** | | | | |
| 803 | Academic areas: classrooms, science, media, music, vocational, spe | | | | |
| 804 | Bench; wood veneer cantilevered w/ptd supports | **69** | LF | $350.00 | $24,150 |
| 805 | Epoxy counter 24" wide | **325** | LF | $325.00 | $105,625 |
| 806 | Plam admin desk, curved @ Admin | **20** | LF | $500.00 | $10,000 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 807 | Plam base cabinet | **35** | LF | $205.00 | $7,175 |
| 808 | Plam base cabinet; mobile on casters | **175** | EA | $550.00 | $96,250 |
| 809 | Plam counter 24" wide | **1,425** | LF | $200.00 | $285,000 |
| 810 | Plam tall cabinets | **4** | EA | $1,000.00 | $4,000 |
| 811 | Plam tall cabinets w/tackable surface | **3** | EA | $1,250.00 | $3,750 |
| 812 | Plam upper cabinet | **197** | LF | $175.00 | $34,475 |
| 813 | Plam work counter oval @ Admin | **10** | LF | $350.00 | $3,500 |
| 814 | Shadow relief | **125** | LF | $1,200.00 | $150,000 |
| 815 | Administration areas, Offices, Medical: | | | | |
| 816 | plam custom base & upper cabinets w/solid surface counter | **20** | LF | $715.00 | $14,300 |
| 817 | tackable surface backsplash | **160** | SF | $24.00 | $3,840 |
| 818 | Interior panel grille | **450** | LF | $150.00 | $67,500 |
| 819 | (4) Adj shelves 12" wide melamine | **602** | LF | $140.00 | $84,280 |
| 820 | (6) Adj shelves 12" wide melamine @ Media | **56** | LF | $210.00 | $11,760 |
| 821 | Other areas: | | | | |
| 822 | Mail slots, melamine | **16** | LF | $250.00 | $4,000 |
| 823 | **12 35 53 Caswork Total** | | | | **$909,605** |
| 824 | | | | | |
| 825 | **12 48 13 Entrance Mats & Frames** | | | | |
| 826 | *Entrance mats* | | | | |
| 827 | RG; Vestibule | **396** | SF | $35.00 | $13,860 |
| 828 | **12 48 13 Entrance Mats & Frames Total** | | | | **$13,860** |
| 829 | | | | | |
| 830 | **12 66 00 Telescoping Stands** | | | | |
| 831 | Motorized telescoping bleachers, motorized | **760** | SEAT | $100.00 | $76,000 |
| 832 | **12 66 00 Telescoping Stands Total** | | | | **$76,000** |
| 833 | | | | | |
| 834 | | | | | |
| 835 | **13-SPECIAL CONSTRUCTION** | | | | |
| 836 | | | | | |
| 837 | **13 00 00 Special Construction** | | | | |
| 838 | *No work in this section* | | | | |
| 839 | **13 00 00 Special Construction Total** | | | | |
| 840 | | | | | |
| 841 | | | | | |
| 842 | **14-CONVEYING EQUIPMENT** | | | | |
| 843 | | | | | |
| 844 | **14 24 00* Hydraulic Elevators** | | | | |
| 845 | Elevators; 3,500#, 4 stops | **1** | EA | $205,000.00 | $205,000 |
| 846 | **14 24 00* Hydraulic Elevators Total** | | | | **$205,000** |
| 847 | | | | | |
| 848 | | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 849 | **21 - 23-MECHANICAL** | | | | |
| 850 | | | | | |
| 851 | **21 00 00* Fire Protection** | | | | |
| 852 | Upright Sprinkler Heads | **260** | EA | $390.00 | $101,400 |
| 853 | Pendent Sprinkler Heads | **817** | EA | $415.00 | $339,055 |
| 854 | Pendent/Upright Sprinkler Heads | **120** | EA | $510.00 | $61,200 |
| 855 | Upright Sprinkler Heads ( Gym) | **70** | EA | $425.00 | $29,750 |
| 856 | Upright Sprinkler Heads ( Auditorium) | **40** | EA | $425.00 | $17,000 |
| 857 | Upright Sprinkler Heads ( Skylights) | **16** | EA | $440.00 | $7,040 |
| 858 | Sidewall Sprinkler Heads | **121** | EA | $514.00 | $62,194 |
| 859 | Window Sprinkler Heads | **22** | EA | $650.00 | $14,300 |
| 860 | Dry Sprinkler Heads | **16** | EA | $495.00 | $7,920 |
| 861 | 8" Water Service | **1** | EA | $6,250.00 | $6,250 |
| 862 | 6" Alarm Valves w/ trim | **1** | EA | $5,560.00 | $5,560 |
| 863 | 6" Backflow Preventer | **1** | EA | $8,500.00 | $8,500 |
| 864 | Zone control w/ standpipe (SCVA) | **14** | EA | $3,650.00 | $51,100 |
| 865 | 6" Riser Valves | **2** | EA | $950.00 | $1,900 |
| 866 | 6" FSP W/ Standpipe | **5** | EA | $2,250.00 | $11,250 |
| 867 | 4" FSP W/ Standpipe | **3** | EA | $2,045.00 | $6,135 |
| 868 | Fire Dept. Connections | **1** | EA | $2,650.00 | $2,650 |
| 869 | Riser Valve w/ tamper switch | **2** | EA | $750.00 | $1,500 |
| 870 | Main piping: | | | | |
| 871 | - 6" | **1,108** | LF | $80.00 | $88,640 |
| 872 | Misc. Valves | **1** | LS | $4,500.00 | $4,500 |
| 873 | Commissioning | **1** | LS | $1,250.00 | $1,250 |
| 874 | Lifting | **1** | LS | $3,800.00 | $3,800 |
| 875 | Testing | **1** | LS | $3,650.00 | $3,650 |
| 876 | Coordination | **1** | LS | $8,100.00 | $8,100 |
| 877 | Coring, Sleeves & sleeves | **1** | LS | $5,450.00 | $5,450 |
| 878 | Seismic Restraints | **1** | LS | $5,900.00 | $5,900 |
| 879 | Shop drawings/hydraulic calculations | **1** | LS | $8,000.00 | $8,000 |
| 880 | **21 00 00* Fire Protection Total** | | | | **$863,994** |
| 881 | | | | | |
| 882 | **22 00 00* Plumbing** | | | | |
| 883 | 6" Water Service w/ sub metera | **1** | EA | $9,500.00 | $9,500 |
| 884 | Hot Water Heater & Storage | | | | |
| 885 | - WH-1 | **1** | EA | $65,000.00 | $65,000 |
| 886 | - WH-2 | **1** | EA | $5,500.00 | $5,500 |
| 887 | Mixing Valves | **1** | EA | $2,450.00 | $2,450 |
| 888 | Circulating Pumps | **2** | EA | $1,050.00 | $2,100 |
| 889 | Expansion Tank | **1** | EA | $2,200.00 | $2,200 |
| 890 | 4" Backflow Preventers | **1** | EA | $5,560.00 | $5,560 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 891 | Pressure Reducing Station | 1 | EA | $3,650.00 | $3,650 |
| 892 | 1" Backflow Preventers | 2 | EA | $1,850.00 | $3,700 |
| 893 | Grease Interceptor System 8,000 gal | 1 | EA | $48,500.00 | $48,500 |
| 894 | Grease Trap | 1 | EA | $3,850.00 | $3,850 |
| 895 | Oily Water Separator | 1 | EA | $4,580.00 | $4,580 |
| 896 | Acid Neutralization Tank | 2 | EA | By Others | |
| 897 | Condensate Pump: | | | | |
| 898 | - CP-1 5 GPH | 1 | EA | $950.00 | $950 |
| 899 | Heat Tracing | 1 | LS | $5,000.00 | $5,000 |
| 900 | Elevator Sump Pump: | | | | |
| 901 | - SP-1 | 1 | EA | $1,850.00 | $1,850 |
| 902 | Reducer Pressure Backflow Preventer: | | | | |
| 903 | - RBP-1 | 1 | EA | $2,500.00 | $2,500 |
| 904 | Emergency Gas Shut Off Valve | 2 | EA | $1,250.00 | $2,500 |
| 905 | Fixtures | | | | |
| 906 | Water Closet P-1 | 20 | EA | $2,455.00 | $49,100 |
| 907 | Water Closet P-1A | 31 | EA | $2,455.00 | $76,105 |
| 908 | Urinal P-2 | 17 | EA | $2,510.00 | $42,670 |
| 909 | Urinal P-2A | 8 | EA | $2,510.00 | $20,080 |
| 910 | Lavatory P-3 | 49 | EA | $2,365.00 | $115,885 |
| 911 | Lavatory P-3A | 28 | EA | $2,365.00 | $66,220 |
| 912 | Drinking Fountain P-4 | 11 | EA | $3,250.00 | $35,750 |
| 913 | Mop Sink P-5 | 5 | EA | $2,850.00 | $14,250 |
| 914 | Shower P-6 | 2 | EA | $3,850.00 | $7,700 |
| 915 | Science Room Sink P-7 | 40 | EA | $3,650.00 | $146,000 |
| 916 | Science Room Sink P-7A | 2 | EA | $3,650.00 | $7,300 |
| 917 | Classroom Sink P-8 | 7 | EA | $2,565.00 | $17,955 |
| 918 | Art Sink P-9 | 3 | EA | $3,250.00 | $9,750 |
| 919 | Art Sink P-9A | 1 | EA | $3,250.00 | $3,250 |
| 920 | Eyewash/Shower P-10 | 5 | EA | $2,250.00 | $11,250 |
| 921 | Fume Hood | 3 | EA | $5,000.00 | $15,000 |
| 922 | Lab Equipment | 1 | LS | $25,000.00 | $25,000 |
| 923 | labs & Consumer Science) | 36 | LS | $385.00 | $13,860 |
| 924 | Floor Clean Outs: | | | | |
| 925 | - FCO-1 | 54 | EA | $725.00 | $39,150 |
| 926 | Floor Drains: | | | | |
| 927 | - 3" FD-A | 14 | EA | $1,050.00 | $14,700 |
| 928 | - 3" FD-B | 8 | EA | $1,065.00 | $8,520 |
| 929 | - 4" FD-B | 5 | EA | $1,165.00 | $5,825 |
| 930 | Trap Primers | 16 | EA | $1,250.00 | $20,000 |
| 931 | Roof Drain: | | | | |
| 932 | - 8 RD-0 | 2 | EA | $1,650.00 | $3,300 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 933 | - 6" RD-1 | **12** | EA | $1,410.00 | $16,920 |
| 934 | - 5" RD-2 | **4** | EA | $1,220.00 | $4,880 |
| 935 | - 4" RD-3 | **8** | EA | $1,010.00 | $8,080 |
| 936 | Cup Sinks | **8** | EA | $1,850.00 | $14,800 |
| 937 | Wall Hydrant | | | | |
| 938 | - WHYD-1 | **18** | EA | $375.00 | $6,750 |
| 939 | Hose Bibbs: | | | | |
| 940 | - HB-1 | **12** | EA | $285.00 | $3,420 |
| 941 | VTR | **9** | EA | $650.00 | $5,850 |
| 942 | | | | | |
| 943 | Storm piping, below grade: | | | | |
| 944 | - 12" | **120** | LF | $125.00 | $15,000 |
| 945 | - 8" | **50** | LF | $85.25 | $4,263 |
| 946 | - 6" | **110** | LF | $62.55 | $6,881 |
| 947 | - 4" | **40** | LF | $43.75 | $1,750 |
| 948 | Storm piping, above grade: | | | | |
| 949 | - 10" | **155** | LF | $110.00 | $17,050 |
| 950 | - 8" | **510** | LF | $92.35 | $47,099 |
| 951 | - 6" | **1,010** | LF | $65.05 | $65,701 |
| 952 | - 4" | **165** | LF | $45.10 | $7,442 |
| 953 | Waste and vent piping, below grade: | | | | |
| 954 | - 5" | **650** | LF | $59.61 | $38,747 |
| 955 | - 4" | **560** | LF | $43.75 | $24,500 |
| 956 | - 3" | **265** | LF | $32.25 | $8,546 |
| 957 | - 2" | **110** | LF | $26.85 | $2,954 |
| 958 | Waste and vent piping, above grade: | | | | |
| 959 | - 4" | **685** | LF | $43.10 | $29,524 |
| 960 | - 3" | **785** | LF | $31.55 | $24,767 |
| 961 | - 2" | **850** | LF | $26.25 | $22,313 |
| 962 | Kitchen Waste Beloe grade: | | | | |
| 963 | - 4" | **510** | LF | $32.00 | $16,320 |
| 964 | - 3" | **40** | LF | $28.95 | $1,158 |
| 965 | - 2" | **290** | LF | $22.50 | $6,525 |
| 966 | Acid Waste below grade: | | | | |
| 967 | - 4" | **425** | LF | $32.00 | $13,600 |
| 968 | - 2" | **290** | LF | $18.00 | $5,220 |
| 969 | Acid Waste below grade: | | | | |
| 970 | - 4" | **295** | LF | $32.00 | $9,440 |
| 971 | - 3" | **210** | LF | $28.25 | $5,933 |
| 972 | - 2" | **265** | LF | $18.00 | $4,770 |
| 973 | Potable Water Piping: | | | | |
| 974 | - 2-1/2" | **620** | LF | $48.95 | $30,349 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 975 | - 2" | **780** | LF | $35.75 | $27,885 |
| 976 | - 1-1/2 | **550** | LF | $30.45 | $16,748 |
| 977 | - 1-1/4 | **475** | LF | $28.35 | $13,466 |
| 978 | - Branch | **8,500** | LF | $25.75 | $218,875 |
| 979 | Insulate Potable Water Piping: | | | | |
| 980 | - 2-1/2" | **620** | LF | $16.40 | $10,168 |
| 981 | - 2" | **780** | LF | $15.65 | $12,207 |
| 982 | - 1-1/2 | **550** | LF | $14.75 | $8,113 |
| 983 | - 1-1/4 | **475** | LF | $14.05 | $6,674 |
| 984 | - Branch | **8,500** | LF | $13.75 | $116,875 |
| 985 | Gas Piping | | | | |
| 986 | - 6" | **50** | LF | $56.25 | $2,813 |
| 987 | - 4" | **80** | LF | $48.95 | $3,916 |
| 988 | - 3" | **120** | LF | $42.25 | $5,070 |
| 989 | - Branch | **980** | LF | $29.65 | $29,057 |
| 990 | Gas Hook-ups | **4** | EA | $850.00 | $3,400 |
| 991 | Master Gas Valves | **2** | EA | $2,850.00 | $5,700 |
| 992 | Pump | **1** | LS | $25,000.00 | $25,000 |
| 993 | Flues to water heater | **120** | LF | $65.00 | $7,800 |
| 994 | Generator Gas Connection | **1** | EA | $5,000.00 | $5,000 |
| 995 | Kitchen | **1** | LS | $50,000.00 | $50,000 |
| 996 | Storm Piping Insulation | **1** | LS | $25,000.00 | $25,000 |
| 997 | Seismic Restraints | **1** | LS | $10,500.00 | $10,500 |
| 998 | Lift & Hoisting | **1** | LS | $18,500.00 | $18,500 |
| 999 | General Requirements | | | | |
| 1000 | Coring, cutting and sleeves | **1** | LS | $15,000.00 | $15,000 |
| 1001 | Commissioning | **1** | LS | $25,000.00 | $25,000 |
| 1002 | Valves and specialties | **1** | LS | $12,500.00 | $12,500 |
| 1003 | Permits & Fees | **1** | LS | $7,850.00 | $7,850 |
| 1004 | Test and sterilize | **1** | LS | $18,500.00 | $18,500 |
| 1005 | Shop drawings | **1** | LS | $16,500.00 | $16,500 |
| 1006 | **22 00 00* Plumbing Total** | | | | **$2,126,673** |
| 1007 | | | | | |
| 1008 | **23 00 00* HVAC** | | | | |
| 1009 | Boilers: | | | | |
| 1010 | - B-1 & 2 3,844 MBH | **2** | EA | $84,568.00 | $169,136 |
| 1011 | Expantion Tank: | | | | |
| 1012 | - ET-1 Thru 3 | **3** | EA | $2,150.00 | $6,450 |
| 1013 | Air Separator: | | | | |
| 1014 | - AS-1 & 2 8" | **2** | EA | $3,950.00 | $7,900 |
| 1015 | Buffer Tank: | | | | |
| 1016 | - BT-1 | **1** | EA | $2,500.00 | $2,500 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1017 | Pumps: | | | | |
| 1018 | - P-1 & 2 HP 790 GPM | **2** | EA | $12,500.00 | $25,000 |
| 1019 | - P-3 & 4 HP 800 GPM | **2** | EA | | Pump House |
| 1020 | - BP-1 | **2** | EA | $2,500.00 | $5,000 |
| 1021 | - CP-1 5 GPH | **5** | EA | $450.00 | $2,250 |
| 1022 | Pumps House | **1** | EA | $185,000.00 | $185,000 |
| 1023 | | | | | |
| 1024 | Chillers: | | | | |
| 1025 | - CH-1 350 Ton | **1** | EA | $367,500.00 | $367,500 |
| 1026 | Rooftop Units: | | | | |
| 1027 | - RTU-1 22,000 CFM | **1** | EA | $264,000.00 | $264,000 |
| 1028 | - RTU-2 22,000 CFM | **1** | EA | $264,000.00 | $264,000 |
| 1029 | - RTU-3 22,000 CFM | **1** | EA | $264,000.00 | $264,000 |
| 1030 | - RTU-4 22,000 CFM | **1** | EA | $264,000.00 | $264,000 |
| 1031 | - RTU-5 15,000 CFM | **1** | EA | $180,000.00 | $180,000 |
| 1032 | - RTU-6 12,000 CFM | **1** | EA | $144,000.00 | $144,000 |
| 1033 | - RTU-7 2,000 CFM | **1** | EA | $28,000.00 | $28,000 |
| 1034 | Make Up Units: | | | | |
| 1035 | - MAU-1 5,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 1036 | Exhaust Fans: | | | | |
| 1037 | - EF-1 2,500 CFM | **1** | EA | $3,250.00 | $3,250 |
| 1038 | - EF-2 2,500 CFM | **1** | EA | $3,250.00 | $3,250 |
| 1039 | - EF-3 500 CFM | **1** | EA | $980.00 | $980 |
| 1040 | - EF-4 500 CFM | **1** | EA | $980.00 | $980 |
| 1041 | - EF-5 250 CFM | **1** | EA | $685.00 | $685 |
| 1042 | - EF-6 250 CFM | **1** | EA | $685.00 | $685 |
| 1043 | - SEF-1 50,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 1044 | - SEF-2 50,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 1045 | - SEF-3 50,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 1046 | - SEF-4 50,000 CFM | **1** | EA | $32,500.00 | $32,500 |
| 1047 | - KEF-1 4,170 CFM | **1** | EA | $4,500.00 | $4,500 |
| 1048 | - FEF-1 1,200 CFM | **1** | EA | $2,100.00 | $2,100 |
| 1049 | - FEF-2 1,200 CFM | **1** | EA | $2,100.00 | $2,100 |
| 1050 | - FEF-3 1,200 CFM | **1** | EA | $2,100.00 | $2,100 |
| 1051 | VAV Boxes: | | | | |
| 1052 | - VAV-8 | **150** | EA | $1,050.00 | $157,500 |
| 1053 | Radiant Heat Panels: | | | | |
| 1054 | - R1 | **2,525** | LF | $135.00 | $340,875 |
| 1055 | Fin-Tube Radiators: | | | | |
| 1056 | - FT-1 | **100** | LF | $90.00 | $9,000 |
| 1057 | Cabinet & Unit Heaters: | | | | |
| 1058 | - CUH-1,2, 7 thru 16 350 MBH | **12** | EA | $895.00 | $10,740 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1059 | - CUH-3 1050 MBH | **1** | EA | $1,150.00 | $1,150 |
| 1060 | - CUH-4 thru 6 450 MBH | **3** | EA | $925.00 | $2,775 |
| 1061 | Ductless Split Units: | | | | |
| 1062 | - DCUe-1 1 Ton | **1** | EA | $2,950.00 | $2,950 |
| 1063 | - DCUe-2 2 Ton | **1** | EA | $4,425.00 | $4,425 |
| 1064 | - DCUe-3 2 Ton | **1** | EA | $4,425.00 | $4,425 |
| 1065 | - DCUe-4 1.5 Ton | **1** | EA | $3,850.00 | $3,850 |
| 1066 | - DCUe-5 1.5 Ton | **1** | EA | $3,850.00 | $3,850 |
| 1067 | - DCUe-6 1.5 Ton | **1** | EA | $3,850.00 | $3,850 |
| 1068 | - DCUe-7 1.5 Ton | **1** | EA | $3,850.00 | $3,850 |
| 1069 | Register & Diffusers: | | | | |
| 1070 | - DD-1 | **22** | EA | $985.00 | $21,670 |
| 1071 | - DD-2 | **18** | EA | $985.00 | $17,730 |
| 1072 | - DD-3 | **16** | EA | $985.00 | $15,760 |
| 1073 | - DD-4 | **1** | EA | $985.00 | $985 |
| 1074 | - DD-5 | **42** | EA | $985.00 | $41,370 |
| 1075 | - DD-6 | **2** | EA | $985.00 | $1,970 |
| 1076 | - DD-7 | **4** | EA | $985.00 | $3,940 |
| 1077 | - Slot | **750** | LF | $45.00 | $33,750 |
| 1078 | - E | **80** | EA | $225.00 | $18,000 |
| 1079 | Misc Diffusers, grills and registers | **1** | LS | $5,000.00 | $5,000 |
| 1080 | Fire & Motor Dampers | **30** | LS | $1,850.00 | $55,500 |
| 1081 | Volume Dampers | **1** | EA | $40,000.00 | $40,000 |
| 1082 | Flex Duct | **1** | LS | $30,000.00 | $30,000 |
| 1083 | Misc. Duct Accessories | **1** | LS | $25,000.00 | $25,000 |
| 1084 | Double Wall Galvanized Duct (Auditorium) | **8,500** | LBS | $20.25 | $172,125 |
| 1085 | Galvanized Duct | **130,000** | LBS | $12.50 | $1,625,000 |
| 1086 | Ductsox | **680** | LF | $45.00 | $30,600 |
| 1087 | Duct Insulation | **45,000** | SF | $4.65 | $209,250 |
| 1088 | Duct Insulation @ Kitchen area | **1** | LS | $35,000.00 | $35,000 |
| 1089 | Black iron at kitchen | **2,125** | LBS | $18.50 | $39,313 |
| 1090 | Duct S/S | **5,000** | LBS | $20.20 | $101,000 |
| 1091 | Seal Ductwork | **7,500** | LF | $1.60 | $12,000 |
| 1092 | Dust Collection System | **1** | LS | $25,000.00 | $25,000 |
| 1093 | Sound Attenuators | | | | |
| 1094 | - SA-1S | **1** | EA | $6,500.00 | $6,500 |
| 1095 | - SA-1R | **1** | EA | $6,500.00 | $6,500 |
| 1096 | - SA-2S | **1** | EA | $6,500.00 | $6,500 |
| 1097 | - SA-2R | **1** | EA | $6,500.00 | $6,500 |
| 1098 | - SA-3S | **1** | EA | $6,500.00 | $6,500 |
| 1099 | - SA-3R | **1** | EA | $6,500.00 | $6,500 |
| 1100 | - SA-4S | **1** | EA | $6,500.00 | $6,500 |

# *Fuller Middle School*

Framingham, MA

137,385 GSF

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1101 | - SA-4R | **1** | EA | $6,500.00 | $6,500 |
| 1102 | - SA-5S | **1** | EA | $6,500.00 | $6,500 |
| 1103 | - SA-5R | **1** | EA | $6,500.00 | $6,500 |
| 1104 | - SA-6S | **1** | EA | $7,800.00 | $7,800 |
| 1105 | - SA-6R | **1** | EA | $6,200.00 | $6,200 |
| 1106 | - SA-7S | **1** | EA | $3,850.00 | $3,850 |
| 1107 | - SA-7R | **1** | EA | $3,850.00 | $3,850 |
| 1108 | - SA-8 | **1** | EA | $4,250.00 | $4,250 |
| 1109 | Hot & Chilles Water Piping | | | | |
| 1110 | - Large Bore | **9,000** | LF | $40.00 | $360,000 |
| 1111 | - Small Bore | **10,500** | LF | $28.00 | $294,000 |
| 1112 | Insulate Hot Water Piping | | | | |
| 1113 | - Large Bore | **9,000** | LF | $16.95 | $152,550 |
| 1114 | - Small Bore | **10,500** | LF | $12.50 | $131,250 |
| 1115 | Equipment Hook-Ups: | | | | |
| 1116 | - 4" Boilers | **2** | EA | $8,950.00 | $17,900 |
| 1117 | - 8" Pump | | EA | | Pump House |
| 1118 | - 4" Pump | **3** | EA | $2,100.00 | $6,300 |
| 1119 | - 8" Chiller | **1** | EA | $14,500.00 | $14,500 |
| 1120 | - RCP | **95** | EA | $1,075.00 | $102,125 |
| 1121 | - CUH | **12** | EA | $1,025.00 | $12,300 |
| 1122 | - FT | **2** | EA | $1,075.00 | $2,150 |
| 1123 | - DD | **105** | EA | $285.00 | $29,925 |
| 1124 | - VAV | **140** | EA | $1,105.00 | $154,700 |
| 1125 | - 4" RTU Coils | **6** | EA | $6,500.00 | $39,000 |
| 1126 | - 2" RTU Coils | **3** | EA | $2,650.00 | $7,950 |
| 1127 | VFD | **1** | LS | $20,000.00 | $20,000 |
| 1128 | Glycol: | | | | |
| 1129 | - GF-1 & 2 | **2** | EA | $6,500.00 | $13,000 |
| 1130 | Combustion | **1** | LS | $30,000.00 | $30,000 |
| 1131 | Flues S/S boiler | **380** | LF | $120.00 | $45,600 |
| 1132 | Seismic Restraints | **1** | LS | $10,500.00 | $10,500 |
| 1133 | Misc. Valves & specialties | **1** | LS | $15,000.00 | $15,000 |
| 1134 | Commissioning support | **1** | LS | $32,000.00 | $32,000 |
| 1135 | Controls | **1** | LS | $755,000.00 | $755,000 |
| 1136 | Testing & Balancing | **1** | LS | $35,600.00 | $35,600 |
| 1137 | Rigging & Lifting | **1** | LS | $12,500.00 | $12,500 |
| 1138 | Permits & Fees | **1** | LS | $8,500.00 | $8,500 |
| 1139 | Shop Drawing | **1** | LS | $15,500.00 | $15,500 |
| 1140 | **23 00 00* HVAC Total** | | | | **$7,879,869** |
| 1141 | | | | | |
| 1142 | | | | | |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1143 | **26,27,28-ELECTRICAL, COMMUNICATION, SECURITY** | | | | |
| 1144 | | | | | |
| 1145 | **26 00 00* Electrical** | | | | |
| 1146 | ***27 00 00 Technology*** | | | | |
| 1147 | ***28 00 00 Integrated Electronic Security System*** | | | | |
| 1148 | *Switchgear, Panelboards, Transformers* | | | | |
| 1149 | *3000/2500 Amp Main Switchboard* | **1** | LS | $110,739.20 | $110,739 |
| 1150 | *Meter Pan* | **1** | EA | $738.10 | $738 |
| 1151 | *SPD @ Swbd* | **1** | EA | $2,855.60 | $2,856 |
| 1152 | *SPD @ Panelboard* | **46** | EA | $1,113.20 | $51,207 |
| 1153 | *100 Amp Panel Board* | **14** | EA | $4,048.66 | $56,681 |
| 1154 | *225 Amp Panel Board* | **9** | EA | $6,749.38 | $60,744 |
| 1155 | *225 Amp Panel Board, 2-Section* | **9** | EA | $11,521.62 | $103,695 |
| 1156 | *400 Amp Panel Board* | **4** | EA | $9,571.10 | $38,284 |
| 1157 | *400 Amp Panel Board, 2-Section* | **1** | EA | $16,443.90 | $16,444 |
| 1158 | *600 Amp Panel Board* | **2** | EA | $13,013.55 | $26,027 |
| 1159 | *800 Amp Panel Board* | **2** | EA | $16,577.00 | $33,154 |
| 1160 | *75 Kva Transformer* | **1** | EA | $7,550.40 | $7,550 |
| 1161 | *225 Kva Transformer K13* | **3** | EA | $42,713.00 | $128,139 |
| 1162 | *800 Amp Disconnect @ Xfmr* | **2** | EA | $7,381.00 | $14,762 |
| 1163 | *Emergency Generator, UPS* | | | | |
| 1164 | *350 Kw Emergency Generator, WP/Sound* | **1** | LS | $147,862.00 | $147,862 |
| 1165 | *Autotransfer Sw 150A* | **1** | EA | $7,148.08 | $7,148 |
| 1166 | *Autotransfer Sw 225A* | **1** | EA | $10,145.85 | $10,146 |
| 1167 | *Autotransfer Sw 400A* | **1** | EA | $12,541.65 | $12,542 |
| 1168 | *150 Amp EG Quick Connect* | **1** | EA | $3,049.20 | $3,049 |
| 1169 | *200/150 Amp Encl Ckt Brkr* | **1** | EA | $1,923.90 | $1,924 |
| 1170 | *225 Amp Encl Ckt Brkr* | **1** | EA | $3,693.53 | $3,694 |
| 1171 | *400 Amp Encl Ckt Brkr* | **1** | EA | $4,283.40 | $4,283 |
| 1172 | *24KW/30Kva UPS, batteries* | **2** | LS | $47,432.00 | $94,864 |
| 1173 | *200 Amp Disconnect @ UPS* | **2** | EA | $1,923.90 | $3,848 |
| 1174 | *Generator Annunciator* | **1** | EA | $1,621.40 | $1,621 |
| 1175 | *Motors:* | | | | |
| 1176 | *Cond Pump Conn* | **12** | EA | $157.30 | $1,888 |
| 1177 | *Install Limit Switch FBO* | **3** | EA | $121.00 | $363 |
| 1178 | *Install Misc Gym CP FBO* | **8** | EA | $465.85 | $3,727 |
| 1179 | *Motor Backbd Conn's, Swiitch* | **8** | EA | $779.24 | $6,234 |
| 1180 | *Scoreboard Conn's, Switch* | **1** | EA | $779.24 | $779 |
| 1181 | *Bleach Motor 20/3A Conn, Switch* | **7** | EA | $779.24 | $5,455 |
| 1182 | *Manual Snap Switch Starter WP* | **5** | EA | $338.80 | $1,694 |
| 1183 | *20/2 Amp Disconnect* | **19** | EA | $444.07 | $8,437 |
| 1184 | *30/1 Amp Disconnect, Elev Cab* | **1** | EA | $444.07 | $444 |
| 1185 | *30/2 Amp Disconnect, mech* | **8** | EA | $584.43 | $4,675 |
| 1186 | *30 Amp Disconnect, mech,kit* | **16** | EA | $779.24 | $12,468 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1187 | *60 Amp Disconnect, mech, kit* | **5** | EA | $1,333.42 | $6,667 |
| 1188 | *100 Amp Disconnect* | **6** | EA | $1,452.00 | $8,712 |
| 1189 | *200 Amp Disconnect, Elev* | **1** | EA | $2,214.30 | $2,214 |
| 1190 | *200/125 Amp Disconnect WP* | **4** | EA | $2,214.30 | $8,857 |
| 1191 | *200/175 Amp Disconnect WP* | **4** | EA | $2,214.30 | $8,857 |
| 1192 | *800 Amp Disconnect CH, WP* | **1** | EA | $8,845.10 | $8,845 |
| 1193 | *Junc Box, mech controls by others* | **13** | EA | $66.55 | $865 |
| 1194 | *Install Nema 0 Motor Starter FBO* | **11** | EA | $356.95 | $3,926 |
| 1195 | *Install Nema 1 Motor Starter FBO* | **2** | EA | $471.90 | $944 |
| 1196 | *Install <=10HP VFD FBO* | **5** | EA | $1,367.30 | $6,837 |
| 1197 | *Install 20HP VFD FBO* | **2** | EA | $2,081.20 | $4,162 |
| 1198 | *Install 25HP VFD FBO* | **2** | EA | $2,734.60 | $5,469 |
| 1199 | *Install 50HP VFD FBO* | **4** | EA | $3,448.50 | $13,794 |
| 1200 | *Chiller CP Conn's* | **1** | EA | $3,726.80 | $3,727 |
| 1201 | | | | | |
| 1202 | *Power Circuitry* | | | | |
| 1203 | *3/4" Emt, empty* | **520** | LF | $10.61 | $5,518 |
| 1204 | *3/4" Emt, 4#12* | **4,760** | LF | $13.85 | $65,924 |
| 1205 | *3/4" Emt, 4#10* | **2,880** | LF | $14.98 | $43,149 |
| 1206 | *1" Emt, 4#8* | **600** | LF | $21.47 | $12,879 |
| 1207 | *1 1/4" Emt, 4#4* | **200** | LF | $29.05 | $5,810 |
| 1208 | *1 1/4" Emt, 4#2* | **2,790** | LF | $32.34 | $90,238 |
| 1209 | *1 1/2" Emt, 4#1* | **850** | LF | $38.81 | $32,990 |
| 1210 | *2" Emt, 4 1/0* | **930** | LF | $44.39 | $41,287 |
| 1211 | *2" Emt, 4 2/0* | **800** | LF | $48.07 | $38,459 |
| 1212 | *2" Emt, 4 3/0* | **200** | LF | $53.49 | $10,699 |
| 1213 | *2 1/2" Emt, 4 4/0* | **80** | LF | $62.02 | $4,962 |
| 1214 | *2 1/2" Emt, 4 250Mcm* | **60** | LF | $66.48 | $3,989 |
| 1215 | *3" Emt, 4 350Mcm* | **420** | LF | $81.49 | $34,227 |
| 1216 | *3 1/2" Emt, 4 500 Mcm* | **1,820** | LF | $105.02 | $191,129 |
| 1217 | *4#6 MI Cable* | **50** | LF | $41.27 | $2,064 |
| 1218 | *4#2 MI Cable* | **200** | LF | $83.99 | $16,797 |
| 1219 | | | | | |
| 1220 | *Service Grounding* | **1** | LS | $5,033.60 | $5,034 |
| 1221 | *Lightning Protection System (Preventor)* | **1** | LS | $34,485.00 | $34,485 |
| 1222 | | | | | |
| 1223 | *Light Fixtures* | | | | |
| 1224 | *Type G4* | **80** | EA | $886.93 | $70,954 |
| 1225 | *Type LK24* | **24** | EA | $474.32 | $11,384 |
| 1226 | *Type LP8* | **9** | EA | $1,185.80 | $10,672 |
| 1227 | *Type LR2* | **1,173** | EA | $411.40 | $482,572 |
| 1228 | *Type LS2* | **1** | EA | $411.40 | $411 |
| 1229 | *Type LS4* | **41** | EA | $310.97 | $12,750 |
| 1230 | *Type LS4A* | **22** | EA | $310.97 | $6,841 |
| 1231 | *Type LS8* | **21** | EA | $621.94 | $13,061 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1232 | *Type LUL* | **61** | EA | $310.97 | $18,969 |
| 1233 | *Type PC1* | **24** | EA | $381.15 | $9,148 |
| 1234 | *Type PC2* | **29** | EA | $381.15 | $11,053 |
| 1235 | *Type PC3* | **186** | EA | $381.15 | $70,894 |
| 1236 | *Type RC1* | **88** | EA | $381.15 | $33,541 |
| 1237 | *Type RC2* | **56** | EA | $381.15 | $21,344 |
| 1238 | *Type RSH* | **1** | EA | $393.25 | $393 |
| 1239 | *Type SP1* | **83** | EA | $617.10 | $51,219 |
| 1240 | *Type SL4 Exterior Wallpack* | **17** | EA | $701.80 | $11,931 |
| 1241 | *Type Exit* | **71** | EA | $332.75 | $23,625 |
| 1242 | *Type LC2* | **72** | LF | $114.35 | $8,233 |
| 1243 | *Type LC3* | **3,090** | LF | $114.35 | $353,326 |
| 1244 | *Type LWS* | **624** | LF | $124.03 | $77,392 |
| 1245 | *Type LSL* | **60** | LF | $130.08 | $7,805 |
| 1246 | | | | | |
| 1247 | *Branch Circuitry* | | | | |
| 1248 | *3/4" Emt, 4#12* | **15,624** | LF | $12.65 | $197,635 |
| 1249 | *MC Cable* | **46,871** | LF | $5.18 | $242,733 |
| 1250 | *3/4" Emt, 4#10* | **880** | LF | $16.66 | $14,662 |
| 1251 | *1" Emt, 4#8* | **60** | LF | $21.47 | $1,288 |
| 1252 | *1" Emt, 4#6* | **160** | LF | $22.87 | $3,659 |
| 1253 | *Plenum Cable* | **9,930** | LF | $1.59 | $15,740 |
| 1254 | | | | | |
| 1255 | *Wiring Devices* | | | | |
| 1256 | *Switches* | **11** | EA | $78.65 | $865 |
| 1257 | *Momentary Contact Switches* | **9** | EA | $124.03 | $1,116 |
| 1258 | *OS, PS Power Pack* | **145** | EA | $181.50 | $26,318 |
| 1259 | *Local Switch/Dimming Station L* | **226** | EA | $151.25 | $34,183 |
| 1260 | *Occupancy Sensor* | **322** | EA | $202.68 | $65,261 |
| 1261 | *Photo Sensor* | **114** | EA | $202.68 | $23,105 |
| 1262 | *Receptacles* | **512** | EA | $78.65 | $40,269 |
| 1263 | *Junc Boxes, Misc* | **5** | EA | $64.13 | $321 |
| 1264 | *Receptacles GFI* | **217** | EA | $96.80 | $21,006 |
| 1265 | *Receptacles Quad* | **317** | EA | $129.47 | $41,042 |
| 1266 | *Receptacles GFI Quad* | **5** | EA | $159.72 | $799 |
| 1267 | *Receptacles GFI WP* | **24** | EA | $177.87 | $4,269 |
| 1268 | *Receptacles w/ I/O Module* | **28** | EA | $96.80 | $2,710 |
| 1269 | *Receptacles Quad w/ I/O Modules* | **3** | EA | $181.50 | $545 |
| 1270 | *Receptacle USB* | **13** | EA | $102.85 | $1,337 |
| 1271 | *Cord Reel Receptacle* | **7** | EA | $580.80 | $4,066 |
| 1272 | *Cond Pump Conn* | **12** | EA | $133.10 | $1,597 |
| 1273 | *Install Leak Det FBO* | **12** | EA | $121.00 | $1,452 |
| 1274 | *Sol Valve Conn* | **2** | EA | $121.00 | $242 |
| 1275 | *FS Conn* | **7** | EA | $121.00 | $847 |
| 1276 | *GSM Conn* | **7** | EA | $121.00 | $847 |

## BUILDING DETAILS - CSI

| | Description | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1277 | Floor Power Outlet | 2 | EA | $399.30 | $799 |
| 1278 | 4-Pole Lighting Contactor | 1 | EA | $635.25 | $635 |
| 1279 | 12-Pole Lighting Contactor | 1 | EA | $1,500.40 | $1,500 |
| 1280 | EPO Pushbutton | 3 | EA | $229.90 | $690 |
| 1281 | Fume Hood Conn | 3 | EA | $157.30 | $472 |
| 1282 | Manual Snap Switch Starter VRF, VAV,misc | 177 | EA | $181.50 | $32,126 |
| 1283 | 20/1 Amp Receptacle L5-20 | 11 | EA | $84.70 | $932 |
| 1284 | 20/1 Amp Eqpt Conn | 12 | EA | $66.55 | $799 |
| 1285 | 30/1 Amp Receptacle L5-30 | 11 | EA | $117.98 | $1,298 |
| 1286 | 30 Amp Receptacle | 3 | EA | $130.08 | $390 |
| 1287 | 30 Amp Stage Receptacle / strip conn | 8 | EA | $798.60 | $6,389 |
| 1288 | 50 Amp Receptacle | 1 | EA | $193.60 | $194 |
| 1289 | 60 Amp Receptacle, weld | 2 | EA | $205.70 | $411 |
| 1290 | | | | | |
| 1291 | Fire Alarm | | | | |
| 1292 | Teflon Cable | 33,345 | LF | $2.34 | $78,113 |
| 1293 | 3" Rigid, Riser Cables | 60 | LF | $114.95 | $6,897 |
| 1294 | Pull Station | 24 | EA | $229.90 | $5,518 |
| 1295 | Audible/Visual | 205 | EA | $347.88 | $71,314 |
| 1296 | Audible/Visual WP | 1 | EA | $405.35 | $405 |
| 1297 | Smoke Detector | 158 | EA | $387.20 | $61,178 |
| 1298 | CO Detector | 5 | EA | $350.90 | $1,755 |
| 1299 | Beam-Type Smoke Detector | 11 | EA | $1,052.70 | $11,580 |
| 1300 | Strobe | 51 | EA | $229.90 | $11,725 |
| 1301 | WP Beacon | 2 | EA | $287.38 | $575 |
| 1302 | Duct Detector | 40 | EA | $889.35 | $35,574 |
| 1303 | Central Equipment, testing, Voice Command | 1 | LS | $66,477.40 | $66,477 |
| 1304 | Radio Box, Antenna, wiring | 1 | EA | $4,549.60 | $4,550 |
| 1305 | Fused Disc | 1 | EA | $738.10 | $738 |
| 1306 | Door Release DH | 6 | EA | $459.80 | $2,759 |
| 1307 | Ansul Conn's | 1 | LS | $895.40 | $895 |
| 1308 | Remote Mic EVAC | 1 | EA | $580.80 | $581 |
| 1309 | Annunciator Panel | 3 | EA | $2,323.20 | $6,970 |
| 1310 | Misc Connections, Relays | 25 | EA | $272.25 | $6,806 |
| 1311 | Knox Box | 1 | EA | $520.30 | $520 |
| 1312 | | | | | |
| 1313 | Communications System | | | | |
| 1314 | MDF Rack, PP's, Terms | 1 | EA | $14,762.00 | $14,762 |
| 1315 | IDF Rack, PP's, Terms | 3 | EA | $7,381.00 | $22,143 |
| 1316 | 4" Floor Sleeves | 16 | EA | $229.90 | $3,678 |
| 1317 | 4" Wall Sleeves | 16 | EA | $229.90 | $3,678 |
| 1318 | Main Ground Bar | 1 | EA | $1,476.20 | $1,476 |
| 1319 | Tel Ground Bar | 3 | EA | $738.10 | $2,214 |
| 1320 | #3/0G Wire | 600 | LF | $9.19 | $5,511 |
| 1321 | Cable Tray 24" Alum | 1,570 | LF | $41.62 | $65,350 |

## BUILDING DETAILS - CSI

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1322 | *12 Strand Multi-Mode Fiber* | **600** | LF | $6.18 | $3,710 |
| 1323 | *6 Strand Multi-Mode Fiber* | **600** | LF | $4.30 | $2,577 |
| 1324 | *Cu Distr Cable* | **600** | LF | $10.29 | $6,171 |
| 1325 | *1" EMT CDT* | **172** | LF | $14.40 | $2,477 |
| 1326 | *2" EMT CDT* | **1,040** | LF | $22.90 | $23,819 |
| 1327 | *4" EMT Cdt* | **200** | LF | $34.64 | $6,928 |
| 1328 | *Cat 6 Cable* | **103,500** | LF | $1.59 | $164,058 |
| 1329 | *WAP Outlet AN 2c* | **14** | EA | $89.54 | $1,254 |
| 1330 | *Tel Outlet* | **60** | EA | $72.60 | $4,356 |
| 1331 | *Data Outlet* | **2** | EA | $72.60 | $145 |
| 1332 | *Data Duplex Outlet 2c* | **78** | EA | $89.54 | $6,984 |
| 1333 | *Tel/Data Outlet 3c* | **76** | EA | $111.93 | $8,506 |
| 1334 | *Floor Tel/Data Outlet 3c* | **6** | EA | $399.30 | $2,396 |
| 1335 | *Tel/Data Outlet T 2c* | **47** | EA | $89.54 | $4,208 |
| 1336 | *TVE 2c* | **50** | EA | $169.40 | $8,470 |
| 1337 | *TVC 2c* | **2** | EA | $169.40 | $339 |
| 1338 | | | | | |
| 1339 | *Clock/ Public Address System:* | | | | |
| 1340 | *2 1/2" Emt, Riser Cables* | **50** | LF | $66.74 | $3,337 |
| 1341 | *3/4" EMT Cdt* | **2,730** | LF | $11.93 | $32,571 |
| 1342 | *1" EMT Cdt* | **2,530** | LF | $14.40 | $36,429 |
| 1343 | *Comm Cable* | **14,100** | LF | $1.59 | $22,350 |
| 1344 | *Main Sound Rack* | **1** | LS | $48,884.00 | $48,884 |
| 1345 | *Local Sound System Rack* | **2** | EA | $7,792.40 | $15,585 |
| 1346 | *Outlet S Speaker* | **232** | EA | $254.10 | $58,951 |
| 1347 | *Outlet S Speaker WP* | **19** | EA | $344.85 | $6,552 |
| 1348 | *Volume Control* | **26** | EA | $181.50 | $4,719 |
| 1349 | *Master Clock GPS* | **1** | EA | $5,493.40 | $5,493 |
| 1350 | *Clock Antenna* | **1** | EA | $1,863.40 | $1,863 |
| 1351 | *Wireless Clock Transceiver* | **1** | EA | $2,855.60 | $2,856 |
| 1352 | *Wireless Clock Repeater* | **4** | EA | $1,427.80 | $5,711 |
| 1353 | *Clock, wireless* | **73** | EA | $254.10 | $18,549 |
| 1354 | | | | | |
| 1355 | *A/V System:* | | | | |
| 1356 | *1" EMT Cdt* | **1,600** | LF | $14.40 | $23,038 |
| 1357 | *BP Button Panel* | **41** | EA | $99.83 | $4,093 |
| 1358 | *R1 Receptacle Panel* | **41** | EA | $99.83 | $4,093 |
| 1359 | *V1 Video Projector* | **41** | EA | $99.83 | $4,093 |
| 1360 | *S1 Speaker* | **82** | EA | $99.83 | $8,186 |
| 1361 | *AV Eqpt, Inst, LV Wiring - Proj/Assist List* | **41** | RM | | |
| 1362 | *J1* | **2** | EA | $99.83 | $200 |
| 1363 | *Data Outlet P Projector* | **1** | EA | $99.83 | $100 |
| 1364 | *Screen* | **1** | EA | $99.83 | $100 |
| 1365 | *R2 Receptacle Panel* | **4** | EA | $169.40 | $678 |
| 1366 | *R3 Receptacle Panel* | **4** | EA | $169.40 | $678 |

## BUILDING DETAILS - CSI

| | Description | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1367 | *Speaker S1 Backbox* | **4** | EA | $99.83 | $399 |
| 1368 | *Speaker S2 Backbox* | **4** | EA | $99.83 | $399 |
| 1369 | *Speaker S3 Backbox* | **14** | EA | $99.83 | $1,398 |
| 1370 | *AV Rack Enclosure* | **1** | EA | $459.80 | $460 |
| 1371 | *AV Eqpt, Installation, LV Wiring - ALLOW* | **1** | LS | | |
| 1372 | *Gym Sound System Mat'l Package* | **1** | LS | $45,000.00 | $45,000 |
| 1373 | *Auditorium AV Roughin* | **1** | LS | $45,000.00 | $45,000 |
| 1374 | *)* | | | | |
| 1375 | *Theater Lighting & Control System:ALLOW (Eqpt in "Equipment Sec* | | | | |
| 1376 | *Lighting and Controls included in "Equipment Section"* | | | | |
| 1377 | *Theat Lighting & Power Roughin* | **1** | LS | $30,000.74 | $30,001 |
| 1378 | *Theat Lighting Controls Roughin* | **1** | LS | $10,000.25 | $10,000 |
| 1379 | | | | | |
| 1380 | *Security Intrusion Alarm System:* | | | | |
| 1381 | *Power Supply Junc Box, 120v* | **1** | EA | $459.80 | $460 |
| 1382 | *Central Eqpt* | **1** | EA | $14,713.60 | $14,714 |
| 1383 | *3/4" Emt, 4#12* | **40** | LF | $13.85 | $554 |
| 1384 | *Plenum Cables* | **4,800** | LF | $1.59 | $7,608 |
| 1385 | *3/4" Emt* | **720** | LF | $11.93 | $8,590 |
| 1386 | *CR Card Reader* | **9** | EA | $810.70 | $7,296 |
| 1387 | *K Keypad* | **2** | EA | $810.70 | $1,621 |
| 1388 | *EL Electric Lock* | **5** | EA | $490.05 | $2,450 |
| 1389 | *EH Electric Hinge* | **30** | EA | $490.05 | $14,702 |
| 1390 | *Intercom* | **2** | EA | $520.30 | $1,041 |
| 1391 | *PT Install Power Transfer Hinge FBO* | **16** | EA | $411.40 | $6,582 |
| 1392 | *REX Req to Exit* | **21** | EA | $290.40 | $6,098 |
| 1393 | *DC Door Position Sw* | **54** | EA | $199.65 | $10,781 |
| 1394 | *M Motion Sensor* | **71** | EA | $411.40 | $29,209 |
| 1395 | *TS Door Switch* | **16** | EA | $181.50 | $2,904 |
| 1396 | *DJ Door Junc Box* | **16** | EA | $139.15 | $2,226 |
| 1397 | | | | | |
| 1398 | *CCTV System:* | | | | |
| 1399 | *3/4" EMT Cdt* | **870** | LF | $11.41 | $9,927 |
| 1400 | *Signal Cables* | **11,400** | LF | $1.59 | $18,070 |
| 1401 | *Monitoring/Recording Eqpt* | **1** | LS | $33,577.50 | $33,578 |
| 1402 | *Viewing Console* | **2** | EA | $1,161.60 | $2,323 |
| 1403 | *Data Outlet CAM, Camera* | **55** | EA | $1,294.70 | $71,209 |
| 1404 | *Data Outlet CAM, Camera WP* | **15** | EA | $1,996.50 | $29,948 |
| 1405 | | | | | |
| 1406 | *BDA System* | **1** | LS | $136,000.00 | $136,000 |
| 1407 | *Area of Rescue Assistance* | **1** | LS | $20,000.00 | $20,000 |
| 1408 | | | | | |
| 1409 | *Temp Power and Lighting* | **1** | LS | $89,540.00 | $89,540 |
| 1410 | **26,27,28-ELECTRICAL, COMMUNICATION, SECURITY TOTAL** | | | | $5,523,083 |
| 1411 | | | | | |

**BUILDING DETAILS - CSI**

| | *Description* | Quantity | Unit | Unit Rate | Total |
|---|---|---|---|---|---|
| 1412 | | | | | |
| 1413 | **31-EARTHWORK** | | | | |
| 1414 | | | | | |
| 1415 | ***31 00 00 Earthwork*** | | | | |
| 1416 | See Sitework | | | | |
| 1417 | **31 00 00 Earthwork Total** | | | | |
| 1418 | | | | | |
| 1419 | | | | | |
| 1420 | | | | | |
| 1421 | | | | | |
| 1422 | | | | | |
| 1423 | | | | | |
| 1424 | | | | | |
| 1425 | | | | | |
| 1426 | | | | | |
| 1427 | | | | | |
| 1428 | | | | | |
| 1429 | | | | | |
| 1430 | | | | | |

# *Fuller Middle School*

Framingham, MA

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | *Quantity* | *Unit* | *Unit Rate* | *Total* |
|---|---|---|---|---|---|
| 9 | **02-EXISTING CONDITIONS** | | | | |
| 10 | | | | | |
| 11 | **02 41 00 Demolition** | | | | |
| 12 | BP#1 | | | | BP#1 |
| 13 | G1020.01 Building Demolition | | | | $0 |
| 14 | 02 30 00 Building Demolition | | | | $0 |
| 15 | Building demoltion | | | | See Main Summa |
| 16 | **02 41 00 Demolition Total** | | | | **$0** |
| 17 | | | | | |
| 18 | | | | | |
| 19 | **31-EARTHWORK** | | | | |
| 20 | | | | | |
| 21 | **31 00 00 Earthwork** | | | | |
| 22 | Site prep | **258,370** | SF | $1.00 | $258,370 |
| 23 | Trench and backfill only | **313** | LF | $45.00 | $14,085 |
| 24 | Baseball field | **0** | 0 | $0.00 | Existing to Rema |
| 25 | **31 00 00 Earthwork Total** | | | | **$272,455** |
| 26 | | | | | |
| 27 | **31 10 00 Site Clearing** | | | | |
| 28 | Site clearing | **7** | ACRE | $5,000.00 | BP#1 |
| 29 | Safety barricade | **1** | AL | $60,000.00 | BP#1 |
| 30 | Construction fence, install, maintain, remove & reinstall; f | **11,344** | LF | $12.00 | BP#1 |
| 31 | Double construction gate | **2** | PR | $2,500.00 | BP#1 |
| 32 | Temporary construction entrance | **2** | LOC | $7,000.00 | BP#1 |
| 33 | Add premium for moving and reinstalling for 3 phases | **1** | LS | $37,385.00 | BP#1 |
| 34 | Temporary Jersey Barriers;  purchase and install | **3,145** | LF | $65.00 | BP#1 |
| 35 | Temp signs | **1** | LS | $3,000.00 | BP#1 |
| 36 | Wash down/re-fueling/parking allowance | **3,000** | SF | $2.00 | BP#1 |
| 37 | Temporary pavement | **47,106** | SF | $3.00 | BP#1 |
| 38 | Temporary sedimentation and runoff basin | **7,348** | SF | $2.00 | BP#1 |
| 39 | **31 10 00 Site Clearing Total** | | | | **$0** |
| 40 | | | | | |
| 41 | **31 23 19 Dewatering and Drainage** | | | | |
| 42 | Dewatering for sitework excavation; allow | **1** | LS | $100,000.00 | BP#1 |
| 43 | **31 23 19 Dewatering and Drainage Total** | | | | **$0** |
| 44 | | | | | |
| 45 | **31 25 00 Erosion and Sedimentation Controls** | | | | |
| 46 | Erosion control barrier | **1,206** | LF | $14.00 | BP#1 |
| 47 | Stockpile area (all phases), qty provided | **35,000** | CY | $2.50 | BP#1 |
| 48 | FM; discharge temp basin to existing DMH | **271** | LF | $75.00 | BP#1 |
| 49 | Stormwater basin | **3,547** | SF | $2.50 | BP#1 |
| 50 | **31 25 00 Erosion and Sedimentation Controls Total** | | | | **$0** |
| 51 | | | | | |

# *Fuller Middle School*

Framingham, MA

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | *Quantity* | *Unit* | *Unit Rate* | *Total* |
|---|---|---|---|---|---|
| 52 | **32-EXTERIOR IMPROVEMENTS** | | | | |
| 53 | | | | | |
| 54 | **32 12 00 Flexible Paving** | | | | |
| 55 | Existing public roadway 'Flagg Drive' to remain | **0** | SF | $0.00 | ETR |
| 56 | Vehicular asphalt pavement, incl's temporary pavement | **202,060** | SF | $3.00 | BP#1 |
| 57 | Raised bituminous pavement (stamped) | **11,716** | SF | $15.00 | BP#1 |
| 58 | Gravel base to roadway & parking lot | **9,445** | CY | $35.00 | BP#1 |
| 59 | 32 17 00 Paving Specialties | **0** | 0 | $0.00 | BP#1 |
| 60 | Crosswalk | **2,350** | SF | $2.50 | BP#1 |
| 61 | Parking stall painting | **302** | EA | $15.00 | BP#1 |
| 62 | Parking stall painting; HC | **12** | EA | $75.00 | BP#1 |
| 63 | Crosswalk striping, temporary | **2,440** | SF | $2.50 | BP#1 |
| 64 | Temporary parking spaces, incl's HC bus | **162** | EA | $75.00 | BP#1 |
| 65 | Jersey barrier between vehicle parking, temporary | **745** | LF | $10.00 | BP#1 |
| 66 | Misc. marking other than above | **1** | LS | $50,000.00 | BP#1 |
| 67 | **32 12 00 Flexible Paving Total** | | | | **$0** |
| 68 | | | | | |
| 69 | **32 13 10 Rigid Paving** | | | | |
| 70 | | | | | $0 |
| 71 | | | | | $0 |
| 72 | | | | | $0 |
| 73 | | | | | $0 |
| 74 | | | | | $0 |
| 75 | | | | | $0 |
| 76 | | | | | $0 |
| 77 | **32 13 10 Rigid Paving Total** | | | | **$0** |
| 78 | | | | | |
| 79 | **32 14 00 Unit Paving** | | | | |
| 80 | Concrete paving/Conc sidewalk | **17,115** | SF | $10.00 | $154,035 |
| 81 | | | | | $0 |
| 82 | | | | | See Earthwork |
| 83 | | | | | See Earthwork |
| 84 | **32 14 00 Unit Paving Total** | | | | **$154,035** |
| 85 | | | | | |
| 86 | **32 16 00 Curbs and Gutters** | | | | |
| 87 | VGC; vertical granite curb | **3,965** | LF | $42.00 | BP#1 |
| 88 | SGC; sloped granite curb | **191** | LF | $43.50 | BP#1 |
| 89 | PCC; precast concrete curb | **8,105** | LF | $25.00 | BP#1 |
| 90 | Bit. berm curb | **1,336** | LF | $5.00 | BP#1 |
| 91 | **32 16 00 Curbs and Gutters Total** | | | | **$0** |
| 92 | | | | | |
| 93 | **32 17 00 Paving Specialties** | | | | |
| 94 | Bituminous conc sidewalk | **26,443** | SF | $2.25 | BP#1 |

# *Fuller Middle School*

Framingham, MA

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | | *Quantity* | *Unit* | *Unit Rate* | | *Total* |
|---|---|---|---|---|---|---|---|
| 95 | Gravel base to concrete pavement | | **807** | CY | $35.00 | | $28,245 |
| 96 | Peastone drip edge around building; 1'-6" wide | | **50** | CY | $75.00 | | $3,750 |
| 97 | Stonedust paving | | **1** | LS | $1,750.00 | | $1,750 |
| 98 | Curb cut | | **15** | EA | $450.00 | | $6,750 |
| 99 | Concrete pad | | **1** | AL | $24,000.00 | BP#1 | |
| 100 | Handicap ramp | | **402** | SF | $20.00 | BP#1 | |
| 101 | Temporary modular handicap ramp | | **138** | SF | $20.00 | BP#1 | |
| 102 | **32 17 00 Paving Specialties Total** | | | | | | **$40,495** |
| 103 | | | | | | | |
| 104 | **32 30 00 Site Improvements** | | | | | | |
| 105 | Unit block retaining wall | | **0** | 0 | $0.00 | | $0 |
| 106 | Footing | | **361** | lf | $0.00 | | $0 |
| 107 | Concrete | | **28** | CY | $135.00 | | $3,780 |
| 108 | Concrete; place | | **28** | CY | $85.00 | | $2,380 |
| 109 | Reinforing | | **1,820** | LBS | $1.10 | | $2,002 |
| 110 | Formwork | | **2,166** | SF | $12.00 | | $25,992 |
| 111 | Wall | | **1,264** | sf | $0.00 | | $0 |
| 112 | Concrete material | | **42** | CY | $135.00 | | $5,670 |
| 113 | Concrete; place | | **42** | CY | $85.00 | | $3,570 |
| 114 | Reinforing | | **6,300** | LBS | $1.10 | | $6,930 |
| 115 | Formwork | | **2,166** | SF | $12.00 | | $25,992 |
| 116 | Wall | | **1,264** | SF | $28.00 | | $35,378 |
| 117 | Concrete bench w/wooden top | | **20** | LF | $275.00 | | $5,500 |
| 118 | | 0 | **0** | 0 | $0.00 | | $0 |
| 119 | Flagpole | | **2** | EA | $7,500.00 | | $15,000 |
| 120 | Bandshell | | **1** | AL | $200,000.00 | | $200,000 |
| 121 | Traffic signs | | **1** | AL | $10,000.00 | BP#1 | |
| 122 | Bollards | | **103** | EA | $800.00 | | $82,400 |
| 123 | Premium for architectural featured bollards | | **1** | LS | $75,000.00 | | $75,000 |
| 124 | Signage | | **1** | AL | $15,000.00 | BP#1 | |
| 125 | Bicycle racks | | **20** | EA | $950.00 | | $19,000 |
| 126 | Basketball pavement | | **0** | 0 | $0.00 | BP#1 | |
| 127 | Basketball court;  fence, gate, court marking | | **1,750** | SF | $35.00 | | $61,250 |
| 128 | **32 30 00 Site Improvements Total** | | | | | | **$569,844** |
| 129 | | | | | | | |
| 130 | **32 31 00 Fences and Gates** | | | | | | |
| 131 | Vehicular guardrail | | **271** | LF | $250.00 | | $67,750 |
| 132 | Wooden guardrail det 7/L3.0 | | **992** | LF | $75.00 | | $74,400 |
| 133 | gates | | **2** | EA | $2,500.00 | | $5,000 |
| 134 | Galvanized handrails @ ramps and steps | | **219** | LF | $250.00 | | $54,750 |
| 135 | **32 31 00 Fences and Gates Total** | | | | | | **$201,900** |
| 136 | | | | | | | |

# *Fuller Middle School*

Framingham, MA

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | *Quantity* | *Unit* | *Unit Rate* | *Total* |
|---|---|---|---|---|---|
| 137 | **32 80 00 Irrigation** | | | | |
| 138 | See the field | | | | $0 |
| 139 | **32 80 00 Irrigation Total** | | | | **$0** |
| 140 | | | | | |
| 141 | **32 92 00 Turfs and Grasses** | | | | |
| 142 | Topsoil for planting beds, shrubs and perennials | **276** | CY | $25.00 | $6,900 |
| 143 | Sports field mix (seed) | **258,370** | SF | $0.35 | $90,430 |
| 144 | Native wildflower meadow | **104,342** | SF | $0.50 | $52,171 |
| 145 | Lawn (seed) | **121,052** | SF | $0.35 | $42,368 |
| 146 | Sod at ampitheater | **25,902** | SF | $1.50 | $38,853 |
| 147 | Sod at play areas | **24,038** | SF | $1.50 | $36,057 |
| 148 | Plant bed | **7,900** | SF | $10.00 | $79,000 |
| 149 | Mulch | **1** | LS | $30,000.00 | $30,000 |
| 150 | Remove and install new irrigation System | **82,000** | SF | $1.25 | $102,500 |
| 151 | South Sports Field | **0** | 0 | $0.00 | By Others |
| 152 | Irrigation in front of Ampitheater | **25,902** | SF | $2.00 | $51,804 |
| 153 | Irrigation at play areas | **24,038** | SF | $2.00 | $48,076 |
| 154 | Fine grading | **121,052** | SF | $0.75 | $90,789 |
| 155 | **32 92 00 Turfs and Grasses Total** | | | | **$668,947** |
| 156 | | | | | |
| 157 | **32 93 00 Plants** | | | | |
| 158 | Trees | **0** | 0 | $0.00 | $0 |
| 159 | AL; Allegheny Serviceberry 2½ - 3" Cal | **12** | EA | $900.00 | $10,800 |
| 160 | AC; Shadblow Serviceberry 2½ - 3" Cal | **1** | EA | $900.00 | $900 |
| 161 | AR; Red Maple 3 - 3½" Cal | **6** | EA | $850.00 | $5,100 |
| 162 | CK; American Yellowwood 3 - 3½" Cal | **24** | EA | $800.00 | $19,200 |
| 163 | FG; American Beech 3 - 3½" Cal | **11** | EA | $850.00 | $9,350 |
| 164 | LT; Tulip Tree 3 - 3½" Cal | **8** | EA | $900.00 | $7,200 |
| 165 | NS; Black Tupelo 3 - 3½" Cal | **15** | EA | $850.00 | $12,750 |
| 166 | OA; Sourwood 2½-3" Cal | **3** | EA | $750.00 | $2,250 |
| 167 | PA; London Plain Tree 3 - 3½" Cal | **24** | EA | $850.00 | $20,400 |
| 168 | QP; Pin Oak 3 - 3½" Cal | **7** | EA | $900.00 | $6,300 |
| 169 | QR; Red Oak 3 - 3½" Cal | **7** | EA | $950.00 | $6,650 |
| 170 | Shrubs | **0** | 0 | $0.00 | $0 |
| 171 | CA; Sweet Pepperbush 3½ - 4' HT | **28** | EA | $95.00 | $2,660 |
| 172 | HQ; Oak-leaf Hydrangea 3 - 3½' HT | **49** | EA | $95.00 | $4,655 |
| 173 | HV; Witch Hazel 7- 8' B+B | **3** | EA | $350.00 | $1,050 |
| 174 | IG; Compact Incberry 2½ - 3' HT | **33** | EA | $125.00 | $4,125 |
| 175 | IV; Winterberry 2 - 2½ HT | **61** | EA | $95.00 | $5,795 |
| 176 | JC; Common Juniper 24" SPD | **0** | EA | $75.00 | $0 |
| 177 | JH; Creeping Juniper 15-24" SPD | **68** | EA | $75.00 | $5,100 |
| 178 | JV; Eastern Red Cedar 7- 8' HT | **26** | EA | $205.00 | $5,330 |
| 179 | MG; Sweetgale 3½ - 4' HT | **38** | EA | $95.00 | $3,610 |

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | *Quantity* | *Unit* | *Unit Rate* | | *Total* |
|---|---|---|---|---|---|---|
| 180 | PF; Pink Beauty Potentilla 24" SPD | **22** | EA | $75.00 | | $1,650 |
| 181 | RA; Grow Low Sumac 2 - 2½' SPD | **47** | EA | $115.00 | | $5,405 |
| 182 | RT; Staghorn Sumac 3 Gal | **13** | EA | $115.00 | | $1,495 |
| 183 | RV; Virginia Rose 2½ - 3' SPD | **0** | EA | $75.00 | | $0 |
| 184 | VA; Lowbush Blueberry 15-24" SPD | **53** | EA | $75.00 | | $3,975 |
| 185 | VD; Arrowwood 4 - 4½' HT | **31** | EA | $150.00 | | $4,650 |
| 186 | VT; Dwarf Cranberry Bush 3 - 3½' HT | **12** | EA | $115.00 | | $1,380 |
| 187 | Groundcover | **0** | 0 | $0.00 | | $0 |
| 188 | CP; Sweet Fern 1 Gal | **1,966** | EA | $15.00 | | $29,490 |
| 189 | Grass at temporary parking area | **6,650** | SF | $0.35 | | $2,328 |
| 190 | Maintenance of landscaping | **1** | LS | $10,000.00 | | $10,000 |
| 191 | **32 93 00 Plants Total** | | | | | **$193,598** |
| 192 | | | | | | |
| 193 | | | | | | |
| 194 | **33-UTILITIES** | | | | | |
| 195 | | | | | | |
| 196 | **33 10 00 Water Distribution** | | | | | |
| 197 | *2" Domestic water service* | ***120*** | *LF* | *$60.00* | *BP#1* | |
| 198 | *6" Fire water service* | ***170*** | *LF* | *$70.00* | *BP#1* | |
| 199 | *Water service; not sized* | ***680*** | *LF* | *$95.00* | *BP#1* | |
| 200 | *Hydrant* | ***5*** | *EA* | *$4,500.00* | *BP#1* | |
| 201 | *Miscellaneous gates, valves, etc. (gate valve 8x8x6)* | ***1*** | *LS* | *$10,000.00* | *BP#1* | |
| 202 | **33 10 00 Water Distribution Total** | | | | | **$0** |
| 203 | | | | | | |
| 204 | **33 31 00 Sanitary Sewerage** | | | | | |
| 205 | 6" DI | **78** | LF | $70.00 | BP#1 | |
| 206 | 6" PVC | **42** | LF | $70.00 | BP#1 | |
| 207 | 8" PVC | **472** | LF | $75.00 | BP#1 | |
| 208 | SMH; Sewer manhole | **4** | EA | $4,500.00 | BP#1 | |
| 209 | CO; Cleanout | **1** | EA | $600.00 | BP#1 | |
| 210 | Connect to existing | **1** | EA | $3,500.00 | BP#1 | |
| 211 | Acid neutralization tank | **2** | EA | $7,500.00 | BP#1 | |
| 212 | Grease trap | **1** | EA | $15,000.00 | BP#1 | |
| 213 | **33 31 00 Sanitary Sewerage Total** | | | | | **$0** |
| 214 | | | | | | |
| 215 | **33 41 00 Storm Utility Drainage** | | | | | |
| 216 | All incl. trench and backfill | **0** | 0 | $0.00 | | $0 |
| 217 | 6" PVC | **47** | LF | $35.00 | BP#1 | |
| 218 | 12" HDPE | **2,435** | LF | $42.00 | BP#1 | |
| 219 | 15" HDPE | **635** | LF | $45.00 | BP#1 | |
| 220 | 18" HDPE | **548** | LF | $48.00 | BP#1 | |
| 221 | 24" HDPE | **371** | LF | $50.00 | BP#1 | |
| 222 | 30" HDPE | **547** | LF | $60.00 | BP#1 | |

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | | *Quantity* | *Unit* | *Unit Rate* | *Total* | |
|---|---|---|---|---|---|---|---|
| 223 | DMH; Manhole | | **9** | EA | $3,500.00 | BP#1 | |
| 224 | CB; catch basin | | **19** | EA | $4,500.00 | BP#1 | |
| 225 | Temporary CB, convert to DMH | | **3** | EA | $4,500.00 | BP#1 | |
| 226 | Headwall @ 24" HDPE end | | **2** | EA | $1,500.00 | BP#1 | |
| 227 | Allowances for: | | **0** | 0 | $0.00 | BP#1 | |
| 228 | Water quality structures | | **4** | EA | $15,000.00 | BP#1 | |
| 229 | Gravel and sod buffer for pretreatment | | **1** | LS | $10,000.00 | BP#1 | |
| 230 | Stormceptors: | | **0** | 0 | $0.00 | BP#1 | |
| 231 | 450i | | **2** | EA | $10,000.00 | BP#1 | |
| 232 | | 3600 | **1** | EA | $35,000.00 | BP#1 | |
| 233 | | 6000 | **1** | EA | $60,000.00 | BP#1 | |
| 234 | Outlet structure | | **1** | EA | $5,000.00 | BP#1 | |
| 235 | Perimeter drainage | | **0** | 0 | $0.00 | Bldg Tab | |
| 236 | **33 41 00 Storm Utility Drainage Total** | | | | | | **$0** |
| 237 | | | | | | | |
| 238 | **33 50 00 Gas Service** | | | | | | |
| 239 | 33 50 00 Gas Service | | **0** | 0 | $0.00 | | $0 |
| 240 | Connection to existing gas main | | **0** | 0 | $0.00 | By Other | |
| 241 | Gas line piping, incl's valves (2) | | **0** | 0 | $0.00 | By Other | |
| 242 | **33 50 00 Gas Service Total** | | | | | | **$0** |
| 243 | | | | | | | |
| 244 | **33 70 00 Electrical Utilities** | | | | | | |
| 245 | Site Lighting, Site Eqpt | | **0** | 0 | $0.00 | | $0 |
| 246 | Type SL1, 1-Fixt, 30' pole | | **45** | EA | $4,767.40 | BP#1 | |
| 247 | Type SL1A, 1-Fixt, 30' pole | | **0** | EA | $4,767.40 | BP#1 | |
| 248 | Type SL3, Wallpack | | **4** | EA | $701.80 | | $2,807 |
| 249 | Type SL3 Pedestrian Light Pole | | **42** | EA | $3,242.80 | | $136,198 |
| 250 | WP Signage w/ Lights, FBO | | **1** | EA | $1,113.20 | | $1,113 |
| 251 | Type SL10 Plant uplight | | **12** | EA | $520.30 | | $6,244 |
| 252 | Receptacle WP GFI | | **5** | EA | $284.35 | | $1,422 |
| 253 | CCTV Camera, Pole Mtd | | **3** | EA | $1,863.40 | | $5,590 |
| 254 | Elect Vehicle Charging Station | | **3** | EA | $1,645.60 | | $4,937 |
| 255 | Relocate Exist EM Call Box | | **2** | EA | $1,113.20 | | $2,226 |
| 256 | Time Clock | | **1** | EA | $1,004.30 | | $1,004 |
| 257 | | 0 | **0** | 0 | $0.00 | | $0 |
| 258 | Branch Circuitry: | | **0** | 0 | $0.00 | | $0 |
| 259 | 3/4" Emt, 4#10 | | **280** | LF | $14.98 | BP#1 | |
| 260 | 1" PVC CDT UG | | **7,110** | LF | $5.41 | BP#1 | |
| 261 | 2" PVC CDT UG | | **900** | LF | $7.70 | BP#1 | |
| 262 | 2 1/2" PVC CDT UG | | **3,600** | LF | $10.31 | BP#1 | |
| 263 | 17x30x12" Site Pullbox | | **16** | EA | $2,323.20 | | $37,171 |
| 264 | Handhole | | **6** | EA | $2,323.20 | | $13,939 |
| 265 | #10 Wire | | **12,400** | LF | $1.25 | | $15,535 |
| 266 | #8 Wire | | **16,050** | LF | $1.76 | | $28,261 |

# *Fuller Middle School*

Framingham, MA

## SITEWORK DIRECT TRADE COST DETAILS - CSI

| | *Description* | | *Quantity* | *Unit* | *Unit Rate* | | *Total* |
|---|---|---|---|---|---|---|---|
| 267 | #6 Wire | | **2,700** | LF | $2.11 | | $5,707 |
| 268 | Signal Cable | | **1,250** | LF | $1.82 | | $2,269 |
| 269 | | 0 | **0** | 0 | $0.00 | | $0 |
| 270 | Site Power, EG Feeders, Utilities: | | **0** | 0 | $0.00 | | $0 |
| 271 | 4" PVC (Primary, empty) UG | | **460** | LF | $16.95 | | $7,797 |
| 272 | 4" PVC CDT, 4 600 Mcm, UG (service) | | **600** | LF | $104.70 | | $62,819 |
| 273 | 4" PVC CDT UG (spare) | | **100** | LF | $16.95 | | $1,695 |
| 274 | 4" PVC CDT, 4 500 Mcm, UG (EG) | | **100** | LF | $87.18 | | $8,718 |
| 275 | 2" PVC, 4#1/0 UG (EG) | | **100** | LF | $29.19 | | $2,919 |
| 276 | 2 1/2" PVC, 4#4/0 UG (EG) | | **100** | LF | $38.87 | | $3,887 |
| 277 | 1" PVC, EG Controls, Misc UG | | **200** | LF | $10.44 | | $2,088 |
| 278 | Utility Pole Riser | | **1** | LF | $4,767.40 | | $4,767 |
| 279 | Utility Transformer Pad | | **1** | LS | $4,162.40 | | $4,162 |
| 280 | Manhole | | **2** | EA | $11,616.00 | | $23,232 |
| 281 | Trenching, Concrete, Backfill | | **1** | LS | $100,000.00 | BP#1 | |
| 282 | | 0 | **0** | 0 | $0.00 | | $0 |
| 283 | Miscellaneous: | | **0** | 0 | $0.00 | | $0 |
| 284 | 4" PVC CDT UG (Comm) | | **800** | LF | $16.95 | | $13,560 |
| 285 | Innerduct | | **600** | LF | $3.99 | | $2,396 |
| 286 | Tel Utility Pole Riser | | **1** | LS | $3,121.80 | | $3,122 |
| 287 | 3'x3' Comm Handhole | | **1** | EA | $6,243.60 | | $6,244 |
| 288 | | 0 | **0** | 0 | $0.00 | | $0 |
| 289 | Misc Site Demo | | **1** | LS | $10,890.00 | BP#1 | |
| 290 | Site Security Lighting | | **1** | LS | $12,584.00 | | $12,584 |
| 291 | Temp Power and Lighting | | **1** | LS | $31,460.00 | | $31,460 |
| 292 | Eqpt Rentals | | **1** | LS | $7,260.00 | | $7,260 |
| 293 | **33 70 00 Electrical Utilities Total** | | | | | | **$463,132** |
| 294 | | | | | | | |
| 295 | | | | | **SITEWORK SUBTOTAL** | | **$2,564,406** |

A.M. Fogarty
& Assoc., Inc.
175 Derby St., Suite 5, Hingham, MA 02043
TEL: (781) 749-7272 • FAX: (781) 740-2652
ptim@amfogarty.com
"Construction Cost Consultants"

# 90% Construction Documents
# Fuller Middle School
# Framingham, MA

26-Sep-19

| | |
|---|---|
| BUILDING AND SITEWORK | $57,411,224 |
| EARLY SITE PACKAGE #1 | $10,956,907 |
| EARLY SITE PACKAGE #2 | $8,738,801 |
| TOTAL CONSTRUCTION COST | $77,106,932 |

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# 90% Construction Documents
# Fuller Middle School
# Framingham, MA

**26-Sep-19**

| | | | | |
|---|---|---|---|---|
| NEW BUILDING | | | | $43,254,839 |
| SITEWORK | | | | $1,674,449 |
| BUILDING DEMOLITION | 196,000 | GSF | $7.50 | $1,470,000 |
| ASBESTOS REMOVAL ( cdw 9/19/19 ) | | | | $1,171,440 |
| OTHER HAZARDOUS MATERIAL ( cdw 9/19/19 ) | | | | $123,050 |
| TOTAL DIRECT COST ( estimated to the mid-point of construction ) | | | | $47,693,778 |
| Chapter 149 a: | | | | |
| DESIGN CONTINGENCY | | 2% | | $953,876 |
| CM CONTINGENCY | | 2.5% | | $1,216,191 |
| ESCALATION ( bid 12/19 ) | | 1.0% | | $498,638 |
| SDI | | | | $0 |
| SUB BOND | | | | $0 |
| GENERAL REQUIREMENTS | | | | $2,389,380 |
| GENERAL CONDITIONS | | | | $2,931,033 |
| TRAFFIC MITIGATION | | | | $0 |
| BUILDING PERMIT | | waived | | |
| GENERAL LIABILITY INSURANCE | | | | $576,109 |
| FEE | | | | $1,152,218 |
| TOTAL CONSTRUCTION COST | | | | $57,411,224 |
| COST PER S.F. | | | | $420.29 |

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& Assoc., Inc.
175 Derby St., Suite 5, Hingham, MA 02043
TEL: (781) 749-7272 • FAX: (781) 740-2652
ptim@amfogarty.com
"Construction Cost Consultants"

| | | |
|---|---|---|
| EARLY SITE PACKAGE #1 | | $8,710,136 |
| TOTAL DIRECT COST ( estimated to the mid-point of construction ) | | $8,710,136 |
| Chapter 149 a: | | |
| SDI | | $120,894 |
| CM CONTINGENCY | 2.5% | $220,776 |
| ESCALATION ( bid 12/19 ) | 2% | $0 |
| GENERAL REQUIREMENTS | | $432,020 |
| GENERAL CONDITIONS | | $586,777 |
| BUILDERS RISK | | $115,218 |
| GENERAL LIABILITY INSURANCE | | $111,429 |
| P&P BOND | | $436,800 |
| FEE | | $222,857 |
| TOTAL CONSTRUCTION COST | | $10,956,907 |

| | | |
|---|---|---|
| EARLY SITE PACKAGE #2 | | $7,339,465 |
| TOTAL DIRECT COST ( estimated to the mid-point of construction ) | | $7,339,465 |
| Chapter 149 a: | | |
| SDI | | $102,386 |
| CM CONTINGENCY | 2.5% | $186,046 |
| ESCALATION ( bid 12/19 ) | 2% | $0 |
| GENERAL REQUIREMENTS | | $363,102 |
| GENERAL CONDITIONS | | $470,414 |
| BUILDERS RISK | IN BP #1 | $0 |
| GENERAL LIABILITY INSURANCE | | $92,462 |
| P&P BOND | IN BP #1 | $0 |
| FEE | | $184,925 |
| TOTAL CONSTRUCTION COST | | $8,738,801 |

| | | | |
|---|---|---|---|
| PROJECT: | Fuller Middle School | NO. OF SQ. FT.: | 136,600 |
| LOCATION: | Framingham, MA | COST PER SQ. FT.: | $328.91 |
| CLIENT: | SMMA Architects | | |
| DATE: | 26-Sep-19 | | |

SUMMARY

No.: 18020

| | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |
|---|---|---|---|
| **DIVISION 02 - EXISTING CONDITIONS** | | | |
| 024117 BUILDING DEMOLITION | 0 | 0% | 0.00 |
| 024180 ASBESTOS ABATEMENT | 0 | 0% | 0.00 |
| **DIVISION 03 - CONCRETE** | | | |
| 033000 CAST IN PLACE CONCRETE | 0 | 0% | 0.00 |
| **DIVISION 04 - MASONRY** | | | |
| 042000 UNIT MASONRY* | 1,794,046 | 4% | 13.13 |
| **DIVISION 05 - METALS** | | | |
| 051200 STRUCTURAL STEEL FRAMING | 0 | 0% | 0.00 |
| 053000 METAL DECKING | 0 | 0% | 0.00 |
| 054000 COLD FORMED METAL FRAMING | 0 | 0% | 0.00 |
| 055000 METAL FABRICATIONS* | 1,765,905 | 4% | 12.93 |
| **DIVISION 06 - WOOD, PLASTICS & COMPOSITES** | | | |
| 061000 ROUGH CARPENTRY | 233,306 | 1% | 1.71 |
| 062000 FINISH CARPENTRY | 846,711 | 2% | 6.20 |
| **DIVISION 07 - THERMAL & MOISTURE PROTECTION** | | | |
| 071000 DAMPPROOF., WATERPROOF. & CAULKING* | 702,224 | 2% | 5.14 |
| 070002 ROOFING AND FLASHING* | 1,724,581 | 4% | 12.63 |
| 072100 THERMAL INSULATION | 312,444 | 1% | 2.29 |
| 072600 VAPOR RETARDERS | 0 | 0% | 0.00 |
| 074214 EXTERIOR WALL PANELS | 1,168,460 | 3% | 8.55 |
| 078100 FIREPROOFING | 306,208 | 1% | 2.24 |
| 078400 FIRESTOPPING | 88,790 | 0% | 0.65 |
| 079513 EXPANSION JOINTS (NO SPEC) | 40,000 | 0% | 0.29 |

| | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |
|---|---|---|---|
| **DIVISION 08 - OPENINGS** | | | |
| 080001 METAL WINDOWS* | 1,790,508 | 4% | 13.11 |
| 080002 GLASS AND GLAZING* | 794,147 | 2% | 5.81 |
| 081113 HOLLOW METAL DOORS & FRAMES | 136,485 | 0% | 1.00 |
| 081416 FLUSH WOOD DOORS | 159,225 | 0% | 1.17 |
| 083100 ACCESS DOORS AND PANELS | 30,000 | 0% | 0.22 |
| 083323 SPECIAL DOORS | 80,793 | 0% | 0.59 |
| 084513 STRUCT-POLYCARBONATE PNL ASSEMB. & SKYLIG | 729,120 | 2% | 5.34 |
| 087100 DOOR HARDWARE | 366,760 | 1% | 2.68 |
| 089000 LOUVERS & VENTS | 84,000 | 0% | 0.61 |
| **DIVISION 09 - FINISHES** | | | |
| 090003 TILE* | 308,119 | 1% | 2.26 |
| 090006 RESILIENT FLOORING* | 840,714 | 2% | 6.15 |
| 090009 PAINTING* | 622,406 | 1% | 4.56 |
| 092116 GYPSUM WALLBOARD ASSEMBLIES | 5,073,206 | 11% | 37.14 |
| 095100 ACOUSTICAL CEILINGS* | 427,380 | 1% | 3.13 |
| 096446 WOOD & ATHLETIC FLOORING | 225,065 | 1% | 1.65 |
| 096712 RESINOUS FLOORING | 109,314 | 0% | 0.80 |
| 096800 CARPET | 8,456 | 0% | 0.06 |
| 097217 DIGITAL IMAGE WALL COVERINGS | 23,500 | 0% | 0.17 |
| 097233 DRY-ERASE WALL COVERING | 166,000 | 0% | 1.22 |
| 097733 SANITARY WALL PANELS | 21,772 | 0% | 0.16 |
| 098100 ACOUSTICAL INSULATION | 0 | 0% | 0.00 |
| 098400 ACOUSTIC ROOM COMPONENTS | 387,392 | 1% | 2.84 |
| 098415 WOOD FIBER ACOUSTICAL PANELS | 106,134 | 0% | 0.78 |
| **DIVISION 10 - SPECIALTIES** | | | |
| 101100 MARKERBOARDS & TACKBOARDS | 14,800 | 0% | 0.11 |
| 101400 SIGNAGE | 88,144 | 0% | 0.65 |
| 102113 TOILET COMPARTMENTS | 55,590 | 0% | 0.41 |
| 102600 WALL AND DOOR PROTECTION | 10,000 | 0% | 0.07 |
| 102813 TOILET ACCESSORIES | 35,127 | 0% | 0.26 |
| 104000 SAFETY SPECIALTIES | 22,800 | 0% | 0.17 |
| 107113 EXTERIOR SUN CONTOL DEVICES | 75,000 | 0% | 0.55 |
| 109000 MISCELLANEOUS SPECIALTIES | 635,944 | 1% | 4.66 |
| **DIVISION 11 - EQUIPMENT** | | | |
| 113100 RESIDENTIAL APPLIANCES | 10,350 | 0% | 0.08 |
| 114000 FOOD SERVICE EQUIPMENT | 415,270 | 1% | 3.04 |
| 115213 PROJECTION SCREENS | 65,000 | 0% | 0.48 |
| 116143 THEATRICAL EQUIPMENT(No Spec) | 866,921 | 2% | 6.35 |
| 116600 ATHLETIC & SPORTS EQUIPMENT | 157,871 | 0% | 1.16 |
| 119000 MISC. EQUIPMENT | 100,550 | 0% | 0.74 |
| | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |

| | | | |
|---|---|---|---|
| **DIVISION 12 - FURNISHINGS** | | | |
| 122400 WINDOW SHADES | 92,976 | 0% | 0.68 |
| 122414 MOTORIZED WINDOW SHADES | 0 | 0% | 0.00 |
| 123553 CASEWORK | 1,577,937 | 4% | 11.55 |
| 124813 FLOOR MATS | 7,920 | 0% | 0.06 |
| 124816 ENTRANCE GRILLES & FRAMES | 0 | 0% | 0.00 |
| 126613 TELESCOPING BLEACHERS | 0 | 0% | 0.00 |
| 129000 MISCELLANEOUS FURNISHING | 106,445 | 0% | 0.78 |
| **DIVISION 13 - SPECIAL CONSTRUCTION** | | | |
| 130000 SPECIAL CONSTRUCTION | 0 | 0% | 0.00 |
| **DIVISION 14 - CONVEYING EQUIPMENT** | | | |
| 140001 ELEVATORS* | 212,000 | 0% | 1.55 |
| **DIVISION 21 - FIRE SUPPRESSION** | | | |
| 210001 FIRE SUPPRESSION* | 853,485 | 2% | 6.25 |
| **DIVISION 22 - PLUMBING** | | | |
| 220001 PLUMBING* | 2,148,401 | 5% | 15.73 |
| **DIVISION 23 - HVAC** | | | |
| 230001 HVAC* | 8,281,591 | 18% | 60.63 |
| **DIVISION 26 - ELECTRICAL** | | | |
| 260001 ELECTRICAL* | 5,947,549 | 13% | 43.54 |
| **DIVISION 31 - EARTHWORK** | | | |
| 310000 EARTHWORK | 464,732 | 1% | 3.40 |
| 311000 SITE PREPARATION & CLEARING | 0 | 0% | 0.00 |
| **DIVISION 32 - EXTERIOR IMPROVEMENTS** | | | |
| 321000 PAVEMENT, CURBING & EDGING | 4,380 | 0% | 0.03 |
| 323100 SITE IMPROVEMENTS | 289,992 | 1% | 2.12 |
| 328000 IRRIGATION | 165,792 | 0% | 1.21 |
| 329000 LANDSCAPING | 457,903 | 1% | 3.35 |
| **DIVISION 33 - UTILITIES** | | | |
| 330000 UTILITIES | 291,650 | 1% | 2.14 |
| | --- | | |
| DIRECT COST | 44,929,288 | 100% | 328.91 |

*DENOTES FILED SUB-BID

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 02 - EXISTING CONDITIONS | | | | |
| 024117 BUILDING DEMOLITION | SEE SUMMARY | | | |
| | | | | 0 |
| 024180 ASBESTOS ABATEMENT | SEE SUMMARY | | | |
| | | | | 0 |
| DIVISION 03 - CONCRETE | | | | |
| 033000 CAST IN PLACE CONCRETE | SEE BID PACKAGE #2 | | | |
| | | | | 0 |
| DIVISION 04 - MASONRY | | | | |
| 042000 UNIT MASONRY* | | | | |
| Exterior Walls: | | | | |
| Backup : | | | | |
| Gym 12" CMU Back-up - Exposed | 7,497 | SF | 25.50 | 191,174 |
| Aud 12" CMU Back-up - Exposed | 7,342 | SF | 25.50 | 187,221 |
| Int GF finish premium | 14,839 | deleted | | |
| *A462 GF is not noted | | | | |
| Masonry Veneer Building ( QTY Noted): | | | | |
| 4x4x12 Scored brick veneer | 6,252 | SF | 31.00 | 193,812 |
| 4x8x8 Scored brick veneer | 6,722 | SF | 33.75 | 226,868 |
| 4x8x16 Scored ground face CMU | 21,025 | SF | 28.00 | 588,700 |
| 4x4x12 Scored ground face CMU | 3,512 | SF | 30.25 | 106,238 |
| Insulation | | W/072000 | | |
| SS Masonry flashing | 1 | LS | 35,000.00 | 35,000 |
| Staging | | inc. w/ unit | | |
| A501 Premium: | | | | |
| Sill brick | | w/Unit Cost | | |
| Lip brick | | w/Unit Cost | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Precast Concrete: | | | | |
| Precast Planter - on grade | 26 | LF | 750.00 | 19,500 |
| Precast Planter - on roof | 24 | LF | 750.00 | 18,000 |
| Misc. BLDG precast veneer | | N/A | | |
| *Site planters are included w/ site improvements | | | | |
| 2nd Floor Main Entry Terrace: | | | | |
| (3/ A316)3'6"H Brick Partial HT wall-com | 26 | LF | 440.00 | 11,440 |
| (3/ A316) Wall Cap | 26 | LF | 175.00 | 4,550 |
| Partitions: | | | | |
| Interior 12" CMU Partition: | | | | |
| Gym - 28' | 4,480 | SF | 26.00 | 116,480 |
| Auditorium - 28' | 2,660 | SF | 26.00 | 69,160 |
| Auditorium - 14' | 420 | SF | 26.00 | 10,920 |
| GF CMU - Aud. Only | 2,660 | SF | 4.50 | 11,970 |
| Acoustical Block - Premium | | deleted | | |
| Stage front CMU pier (5 loc) | 22.5 | SF | 55.00 | 1,238 |
| CMU Partition (Gym & Aud): | | | | |
| Bond beam | 37 | LF | 48.00 | 1,776 |
| | | | | 1,794,046 |

DIVISION 05 - METALS

051200 STRUCTURAL STEEL FRAMING

SEE BID PACKAGE #2

0

053000 METAL DECKING

SEE BID PACKAGE #2

0

054000 COLD FORMED METAL FRAMING

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| *w/ gypsum drywall | | | | |
| | | | | 0 |
| 055000 METAL FABRICATIONS* | | | | |
| Elevators: | | | | |
| Elev. framing | 1 | EA | 3,000.00 | 3,000 |
| Elev. pit ladder | 1 | EA | 1,537.00 | 1,537 |
| Elev. sump grate | 1 | EA | 1,500.00 | 1,500 |
| Exterior Walls: | | | | |
| 42" Perf Metal Guardrail: | | | | |
| LVL 2 entry | 11 | LF | 350.00 | 3,850 |
| LVL 2 emerg. egress | 42 | LF | 350.00 | 14,700 |
| LVL 2 emerg. egress stair wall rail | 8 | LF | 145.00 | 1,160 |
| Galv, loose lintel (per 5600-604) | 133 | LF | 36.00 | 4,788 |
| Misc metals @ ext wall - allow | 1 | LS | 25,000.00 | 25,000 |
| Reliving angle | | W /Structural | | |
| Bolted galv. sill angle @ fnd | | W /Structural | | |
| Support clip @ skylight curb (spec) | 567 | LF | 125.00 | 70,875 |
| Exterior Doors: | | | | |
| OH door frame @: | | | | |
| Tech-Makerspace | 1 | EA | 500.00 | 500 |
| Special Doors: | | | | |
| LVL 1 Corridor Security Gate- sgl ( 7' x7'1 | 2 | EA | 7,000.00 | 14,000 |
| Partitions: | | | | |
| Folding Panel partition Support (18/A620): | | | | |
| Typ classroom (13 EA) | 208 | LF | 165.00 | 34,320 |
| Music classroom (DBL panel 1 EA) | 19 | LF | 330.00 | 6,270 |
| SPED suite (3 EA) | 120 | LF | 165.00 | 19,800 |
| Folding Grille Support @: | | | | |
| Learning common | 46 | LF | 200.00 | 9,200 |
| Sgl custom security gate (7'w) | 2 | EA | 4,000.00 | 8,000 |
| Coiling Grille Support @: | | | | |
| Servery | 35 | LF | 100.00 | 3,500 |
| Main office(1 EA) | 21 | LF | 100.00 | 2,100 |
| CMU Partition (Gym & Aud): | | | | |
| CMU clip @ 4' oc | 70 | EA | 115.00 | 8,050 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Misc Metals @ Corridor Locker Enclosure (nic mtl locker) - allow (7/A650): | | | | |
| 1st Floor (307 LF) | | N/A | | |
| Upper floors | 724 | LF | 425.00 | 307,700 |
| Misc. metals | 136,600 | GSF | 1.00 | 136,600 |
| Fittings: | | | | |
| Auditorium: | | | | |
| Stage front access stair rails (9/A602) | 32 | LF | 145.00 | 4,640 |
| Aisle access stair rails (11/A602) | 34 | LF | 145.00 | 4,930 |
| Auditorium equip. supports | 1 | LS | 15,000.00 | 15,000 |
| Interior Metals: | | | | |
| 1st Flr guard rail (5.39) | 20 | LF | 350.00 | 7,000 |
| 2nd & 3rd Flr Lobby guard rail (6/A650) | 327 | LF | 450.00 | 147,150 |
| Cohort # 2059 2nd Flr Lobby guard rail (6 | 19 | LF | 450.00 | 8,550 |
| OT/PT equip support-allow | 1 | RM | 2,500.00 | 2,500 |
| Gym equip supports | 1 | LS | 10,000.00 | 10,000 |
| Concealed stl angle @ corr built-in bench | | W/ Unit Cost | | |
| Concealed stl angle @ casework ctr | | W/ Unit Cost | | |
| Ships ladder @ gym storage | 1 | EA | 15,000.00 | 15,000 |
| Interior: | | | | |
| 4/ A601 Curved perf arch grille - classroom | 1,536 | SF | 50.00 | 76,800 |
| Support atrium vert duct encl. | 4 | LOC | 10,000.00 | 40,000 |
| Exterior Rails: | | | | |
| Roof ladder (3 EA) | 30 | VLF | 425.00 | 12,750 |
| Loading dock stair/ramp guardrail | 15 | LF | 265.00 | 3,975 |
| Loading dock stair/ramp wall rail | 15 | LF | 150.00 | 2,250 |
| 2nd flr entry terrace guardrail | 30 | LF | 500.00 | 15,000 |
| High roof safety rail - allow | 150 | LF | 125.00 | 18,750 |
| Stair Construction: | | | | |
| 5' 6"W Metal Pan Stair #3 @ Learning Commons 1st- 2nd (1 FLT): | | | | |
| Metal pan stair treads/risers | 132 | LFR | 95.00 | 12,540 |
| Metal pan landing | 33 | SF | 75.00 | 2,475 |
| Guardrail | 66 | LF | 400.00 | 26,400 |
| Cane rail | 1 | EA | 1,350.00 | 1,350 |
| 8'6" W Metal Pan Stair #14 @ Learning Commons 1st- 2nd ( 1 FLT): | | | | |
| Metal pan stair treads/risers | 204 | LFR | 95.00 | 19,380 |
| Metal pan landing | 51 | SF | 75.00 | 3,825 |
| Guardrail | 66 | LF | 400.00 | 26,400 |
| Cane rail | 1 | EA | 1,350.00 | 1,350 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 5'10" W Metal Pan Stair #6 @ Learning Commons 2nd - 3rd( 1 FLT): | | | | |
| Metal pan stair treads/risers | 138 | LFR | 95.00 | 13,110 |
| Metal pan landing | 33 | SF | 75.00 | 2,475 |
| Guardrail | 66 | LF | 400.00 | 26,400 |
| 8' 6"W Metal Pan Stair #5 @ Learning Commons 2nd - 3rd(1 FLT): | | | | |
| Metal pan stair treads/risers | 204 | LFR | 95.00 | 19,380 |
| Metal pan landing | 55 | SF | 75.00 | 4,125 |
| Guardrail | 66 | LF | 400.00 | 26,400 |
| 5' W Metal Pan Stair Hall 1 & 2 ( 2 loc 1st - 3rd 4 FLT): | | | | |
| Metal pan stair treads/risers | 480 | LFR | 95.00 | 45,600 |
| Metal pan landing | 240 | SF | 75.00 | 18,000 |
| Wall rail | 128 | LF | 165.00 | 21,120 |
| Guardrail | 128 | LF | 400.00 | 51,200 |
| Guardrail flr open | 12 | LF | 400.00 | 4,800 |
| Cane rail | 2 | EA | 1,350.00 | 2,700 |
| 5' W Metal Pan Stair @ #1 Penthouse ( 1 FLT): | | | | |
| Metal pan stair treads/risers | 120 | LFR | 95.00 | 11,400 |
| Metal pan landing | 60 | SF | 75.00 | 4,500 |
| Wall rail | 32 | LF | 165.00 | 5,280 |
| Guardrail | 32 | LF | 400.00 | 12,800 |
| Access gate | 1 | EA | 1,800.00 | 1,800 |
| * Typ, perforated steel panel guardrail sys | | | | |
| Aud Rails & Stairs | | W/ C1030 | | |
| Lobby rails | | W/ C1030 | | |
| Ceiling Finishes: | | | | |
| Note #5.55 Perf Arch Grille: | | | | |
| 3rd Flr clg -12"W | 210 | SF | 200.00 | 42,000 |
| Site Development: | | | | |
| Ramp and Planter Walls: | | | | |
| Railings | 146 | LF | 250.00 | 36,500 |
| Site Stair: | | | | |
| Site stair railing | 33 | LF | 250.00 | 8,250 |
| Site decorative bollard | 103 | EA | 2,200.00 | 226,600 |
| Stage Plenum (7/A602): | | | | |
| Perf. arch grille - stage front | 120 | SF | 225.00 | 27,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | 1,765,905 |
| DIVISION 06 - WOOD, PLASTICS & COMPOSITES | | | | |
| 061000 ROUGH CARPENTRY | | | | |
| Exterior Windows: | | | | |
| P.T. - perm blocking | 9,009 | LF | 8.65 | 77,928 |
| Exterior Doors: | | | | |
| P.T. - perm blocking HM open | 316 | LF | 8.00 | 2,528 |
| Partitions: | | | | |
| Interior blocking | 136,600 | GSF | 0.50 | 68,300 |
| Misc. rough carpentry | 136,600 | GSF | 0.50 | 68,300 |
| (5/A601) Frame AV monitor box | 65 | EA | 250.00 | 16,250 |
| | | | | 233,306 |
| 062000 FINISH CARPENTRY | | | | |
| Exterior Walls: | | | | |
| Main Entry LVL 2: | | | | |
| Wd bench @ precast planter | 24 | LF | 550.00 | 13,200 |
| Phenolic bench @ col. M | 7 | LF | 500.00 | 3,500 |
| Partitions: | | | | |
| Interior Borrowed Light Window /Sidelight-A620 (NIC Break out Area): | | | | |
| PTD MDF sill 9" | 866 | LF | 32.00 | 27,712 |
| PTD MDF head 9" | 866 | LF | 25.00 | 21,650 |
| PTD MDF jamb 9" | | N/A | | |
| Fittings: | | | | |
| Finish Carpentry: | | | | |
| A312 Int window panel grilles (Rulon) | 450 | LF | 150.00 | 67,500 |
| *casework is included w/ E2010 | | | | |
| Wall Finishes: | | | | |
| (16/A621) 18" PTD MDF Bumper w/HD Bamboo Wd Marker Tray: | | | | |
| Bumper Rail | 3,480 | LF | 45.00 | 156,600 |
| Bumper Top | 3,480 | LF | 30.00 | 104,400 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Wall Finish: | | | | |
| P.lam Wall Panel: | | | | |
| 11/A600 Drinking Fountain Alcove (7 loc | 245 | SF | 55.00 | 13,475 |
| P.Lam wall panel @ class entry controls | 59 | LOC | 550.00 | 32,450 |
| Auditorium vestibule | 393 | SF | 48.00 | 18,864 |
| Stage full ht | 2,880 | SF | 48.00 | 138,240 |
| Ceiling Finishes: | | | | |
| Auditorium/Stage-(A461 & A691): | | | | |
| Clouds - allow | 2,076 | SF | 120.00 | 249,120 |
| *Clouds 3/4" Veneer w/wood trim - includes hardware and hangers | | | | |
| | | | | 846,711 |

DIVISION 07 - THERMAL & MOISTURE PROTECTION

071000 DAMPPROOF., WATERPROOF. & CAULKING*

| | | | | |
|---|---|---|---|---|
| Foundations: | | | | |
| Foundation dampproofing | 6,884 | SF | 1.90 | 13,080 |
| Retaining wall waterproofing | 1,360 | SF | 6.85 | 9,316 |
| Elev. pit waterproofing | 1 | LOC | 4,300.00 | 4,300 |
| Exterior Walls: | | | | |
| Fluid Applied air & vapor barrier: | | | | |
| Exterior Wall - CMU & Sheathing | 59,125 | SF | 8.00 | 473,000 |
| Bay covered entry | 1,119 | SF | 8.00 | 8,952 |
| Exterior Windows: | | | | |
| Flex flashing - perm | 9,009 | LF | 8.00 | 72,072 |
| Exterior Doors: | | | | |
| Perm. Ext HM & OH opening: | | | | |
| Flex flashing - perm | 348 | LF | 8.00 | 2,784 |
| Exterior sealants - perm. | 348 | LF | 7.50 | 2,610 |
| Partitions: | | | | |
| Joint sealants | 136,600 | GSF | 0.85 | 116,110 |
| | | | | 702,224 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 070002 ROOFING AND FLASHING* | | | | |
| Exterior Walls: | | | | |
| (1/A543) Raised Common Exterior Wall: | | | | |
| 5'6"H Rigid Insul. W/ PVC Membrane( sa | 2,486 | SF | 15.00 | 37,290 |
| Flat Roof Blocking @: | | | | |
| Base flashing | 1,620 | LF | 12.50 | 20,250 |
| Typ roof fascia | 3,182 | LF | 12.50 | 39,775 |
| Expansion joint | 86 | LF | 40.00 | 3,440 |
| Gable skylight curb ( 4 EA) | 567 | LF | 45.00 | 25,515 |
| Flash Pre Fab Roof Top Mech curb block | 618 | LF | 35.00 | 21,630 |
| Misc Equip blocking | 1 | LS | 7,500.00 | 7,500 |
| Roof hatch | 1 | EA | 750.00 | 750 |
| Atrium vent | 4 | EA | 750.00 | 3,000 |
| Roofing (A502): | | | | |
| White 60 mil PVC Roofing w/R-36 (6" Insul ) : | | | | |
| Typ Flat roof | 64,092 | SF | 16.50 | 1,057,518 |
| 1/2 " glass mat cover bd -100% | 64,092 | SF | 1.45 | 92,933 |
| 1/2" glass mat protection bd(nic conc deck | 23,302 | SF | 1.45 | 33,788 |
| 1/2" glass mat protection 2 lyrs aud | 7,563 | SF | 5.20 | 39,328 |
| Poly vapor retarder-100% | 64,092 | SF | 0.42 | 26,919 |
| 3' High Rubber Walkway Pad | 765 | SF | 7.00 | 5,355 |
| Membrane flashing | 64,092 | SF | 0.50 | 32,046 |
| Base flashing | 1,620 | LF | 32.00 | 51,840 |
| Alum Typ roof fascia | 3,182 | LF | 22.00 | 70,004 |
| Expansion joint - allow | 86 | LF | 185.00 | 15,910 |
| Flash gable skylight curb ( 4 EA) | 567 | LF | 32.00 | 18,144 |
| Flash Pre Fab Roof Top Mech encl curb | 618 | LF | 32.00 | 19,776 |
| Scupper - allow | 4 | EA | 750.00 | 3,000 |
| Flash roof drain - allow | 32 | EA | 135.00 | 4,320 |
| Entry pier/chimney cap flashing -complete | 55 | SF | 100.00 | 5,500 |
| Misc roof flashing | 1 | LS | 25,000.00 | 25,000 |
| Premium Terrace Paver Sys (1/A316): | | | | |
| Main entrance #2000 | 730 | SF | 45.00 | 32,850 |
| *Includes Sections 075419, 076200, 077236 & 086300 | | | | |
| Roof Openings: | | | | |
| Roof hatch | 1 | EA | 4,200.00 | 4,200 |
| Stage vent-allow | 2 | EA | 13,500.00 | 27,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | 1,724,581 |
| 072100 THERMAL INSULATION | | | | |
| Slab on Grade: | | | | |
| 2" Rigid Slab Insul.- 4' @ perm. | SEE BID PACKAGE #1 | | | |
| Exterior Walls: | | | | |
| Exterior Wall A501: | | | | |
| 3" Mineral fiber insul @ masonry | 43,331 | SF | 3.72 | 161,191 |
| 4" Mineral fiber insul @ panel wall | 11,380 | SF | 4.15 | 47,227 |
| Spray foam at perm openings | 9,299 | LF | 8.25 | 76,717 |
| Aud Roof Deck: | | | | |
| Insulate aud deck flutes | 7,563 | SF | 2.00 | 15,126 |
| 6/A323 Exterior Wall - Raised Commons: | | | | |
| 4" Mineral fiber insul | 2,486 | SF | 2.65 | 6,588 |
| Exterior Ceiling Insulation @ : | | | | |
| Bay / covered entry | 1,119 | SF | 5.00 | 5,595 |
| | | | | 312,444 |
| 072600 VAPOR RETARDERS | | | | |
| *Excludes under slab waterproofing system | | | | |
| | | | | 0 |
| 074214 EXTERIOR WALL PANELS | | | | |
| Exterior Walls: | | | | |
| Exterior Wall Panel System: | | | | |
| Corrugated metal panel | 5,500 | SF | 48.00 | 264,000 |
| Composite metal panel | 2,662 | SF | 55.00 | 146,410 |
| Phenolic panel | 8,518 | SF | 76.00 | 647,368 |
| Exterior Ceiling Stucco System: | | | | |
| Bay/covered entry | 1,119 | SF | 32.00 | 35,808 |
| 8'H Mech roof screen(NIC Struct Frame - 8/A325): | | | | |
| 8' Corrugated Perf Mtl wall panel-complete | 1,112 | SF | 42.00 | 46,704 |
| Screen wall cap - allow | 139 | LF | 30.00 | 4,170 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| (2 sided) Phenolic fin - complete: | | | | |
| 3' Fin 12'4"H (5 loc) | 200 | SF | 120.00 | 24,000 |
| *Includes Sections 074214 & 074224 | | | | |
| | | | | 1,168,460 |
| 078100 FIREPROOFING | | | | |
| Floor Construction: | | | | |
| Allow: | | | | |
| Spray fireproofing | 68,431 | SF | 3.00 | 205,293 |
| Roof Construction: | | | | |
| Allow: | | | | |
| Spray fireproofing | 36,041 | SF | 2.80 | 100,915 |
| | | | | 306,208 |
| 078400 FIRESTOPPING | | | | |
| Partitions: | | | | |
| Firestopping | 136,600 | GSF | 0.65 | 88,790 |
| | | | | 88,790 |
| 079513 EXPANSION JOINTS (NO SPEC) | | | | |
| Exterior Walls: | | | | |
| Control and expansion joints | 1 | LS | 30,000.00 | 30,000 |
| Partitions: | | | | |
| Int Wall Expansion joints | 1 | LS | 10,000.00 | 10,000 |
| | | | | 40,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 08 - OPENINGS | | | | |
| 080001 METAL WINDOWS* | | | | |
| Exterior Doors: | | | | |
| Alum. Doors (Incl. Glass, Glazing): | | | | |
| 7' 1st Flr Entry - sgl | 2 | EA | 4,100.00 | 8,200 |
| 7' 1st Flr Entry - dbl | 3 | PR | 8,200.00 | 24,600 |
| 7' 2nd Flr Entry - sgl | 1 | EA | 4,100.00 | 4,100 |
| 7' 2nd Flr Entry - dbl | 1 | PR | 8,200.00 | 8,200 |
| 7' Main office egress - sgl | 1 | EA | 4,100.00 | 4,100 |
| 7' Stair egress - sgl | 2 | EA | 4,100.00 | 8,200 |
| 7' Staff lunch rm | 1 | EA | 4,100.00 | 4,100 |
| 8' Media ctr - sgl | 1 | EA | 4,100.00 | 4,100 |
| Premium : | | | | |
| Auto opener | 2 | EA | 4,500.00 | 9,000 |
| Ext. School Guard (6 lvs ) - Factory glazing | 90 | SF | 36.00 | 3,240 |
| Interior Doors: | | | | |
| Aluminum ( Frame, Door, Glass, Glazing and Hdw): | | | | |
| 7' 1st Flr Entry Vestibule - sgl | 1 | EA | 4,000.00 | 4,000 |
| 7' 1st Flr Entry Vestibule - dbl | 2 | PR | 8,150.00 | 16,300 |
| 8' 2nd Flr Entry Vestibule- sgl | 1 | EA | 4,400.00 | 4,400 |
| 8' 2nd Flr Entry Vestibule - dbl | 1 | PR | 8,600.00 | 8,600 |
| Premium: | | | | |
| Int. School Guard ( 9 lvs ) - Factory glazing | 135 | SF | 36.00 | 4,860 |
| Exterior Windows - Allow: | | | | |
| Storefront | 14,204 | SF | 110.00 | 1,562,440 |
| Exterior sealants - perm. | 9,009 | LF | 7.50 | 67,568 |
| ALLOW: | | | | |
| Security Glazing Film 2nd flr entry | 125 | SF | 36.00 | 4,500 |
| Exterior Wall Mock-up | 1 | LS | 35,000.00 | 35,000 |
| Partitions: | | | | |
| Aluminum Storefront Frame, Glass & Glazing-Allow: | | | | |
| 1st Floor Vestibule (11A/A221) | | w/B2010 | | |
| Office/ vestibule security window (6/A403) | | | | |
| 2nd Flr Main office | 1 | EA | 5,000.00 | 5,000 |
| | | | | 1,790,508 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 080002 GLASS AND GLAZING* | | | | |
| Fittings: | | | | |
| Multi User Toilet & Locker Rm (16 ea): | | | | |
| 5'H mirror @ lav ctr | 1,215 | SF | 38.00 | 46,170 |
| Dressing Rm (2 ea): | | | | |
| 5'H mirror @ ctr | 90 | SF | 38.00 | 3,420 |
| Site Development: | | | | |
| Band Shell (A500): | | | | |
| 9/16 " Temp. lam glazing - roof | 132 | SF | 175.00 | 23,100 |
| 9/16 " Temp. lam glazing - wall | 254 | SF | 175.00 | 44,450 |
| Partitions: | | | | |
| Interior Window /Sidelight-A620 (NIC Break out Area): | | | | |
| SGL Alum channel ,glass & glazing | 5,071 | SF | 62.00 | 314,402 |
| DBL Alum channel ,glass & glazing | 930 | SF | 88.00 | 81,840 |
| GL-Graduated pattern film premium | 3,094 | SF | 10.00 | 30,940 |
| 3m Safety Glazing | 4,332 | SF | 15.00 | 64,980 |
| Interior Doors: | | | | |
| Glass & Glazing @ Interior Wood Door: | | | | |
| Sgl C1 7'H ( 6 EA ) | 60 | SF | 48.00 | 2,880 |
| Sgl C1 8'H ( 105 EA ) | 1,260 | SF | 48.00 | 60,480 |
| Dbl C2 8'H ( 9 EA ) | 216 | SF | 48.00 | 10,368 |
| Dbl C3 8'H ( 1 EA ) | 4 | SF | 48.00 | 192 |
| Breakout Space: | | | | |
| Breakout A( 2 story): | | | | |
| Glass wall w/ perim trim | 381 | SF | 75.00 | 28,575 |
| Glass wall w/ perim trim | 646 | SF | 75.00 | 48,450 |
| Breakout D( 1 story): | | | | |
| Glass wall w/ perim trim | 202 | SF | 75.00 | 15,150 |
| Breakout E ( 1 story): | | | | |
| Glass wall w/ perim trim | 250 | SF | 75.00 | 18,750 |
| | | | | 794,147 |
| 081113 HOLLOW METAL DOORS & FRAMES | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Interior Doors: | | | | |
| Int. HM Door Frame: | | | | |
| Single Door 7'H | 22 | EA | 285.00 | 6,270 |
| Double Door 7'H | 1 | EA | 305.00 | 305 |
| Single Door 8' H | 251 | EA | 320.00 | 80,320 |
| Double door 8'H | 26 | EA | 345.00 | 8,970 |
| Int. HM Door: | | | | |
| Sgl B1 7'H | 15 | EA | 495.00 | 7,425 |
| 90 Min Sgl B1 7'H | 1 | EA | 530.00 | 530 |
| Dbl B2 7'H | 1 | EA | 990.00 | 990 |
| Sgl B1 8'H | 25 | EA | 540.00 | 13,500 |
| 90 Min Sgl B1 8'H | 1 | EA | 565.00 | 565 |
| 90 Min Dbl B2 8'H | 3 | EA | 1,130.00 | 3,390 |
| Exterior Doors: | | | | |
| Ext Insulated HM Doors and Frame: | | | | |
| Sgl B1 7'H | 4 | EA | 585.00 | 2,340 |
| Dbl B2 7'H | 1 | EA | 1,170.00 | 1,170 |
| Sgl B1 8'H | 1 | EA | 630.00 | 630 |
| Dbl B2 8'H | 8 | EA | 1,260.00 | 10,080 |
| Partitions: | | | | |
| Interior HM Frame Glass & Glazing: | | N/A | | |
| | | | | 136,485 |

081416 FLUSH WOOD DOORS

| | | | | |
|---|---|---|---|---|
| Interior Doors: | | | | |
| Int. Prefinished Wood Door (Glass): | | | | |
| Sgl B1 2'x 8'H | 35 | EA | 490.00 | 17,150 |
| Sgl B1 3'x 8'H | 77 | EA | 530.00 | 40,810 |
| 90 Min Sgl B1 3'x 8'H | 8 | EA | 560.00 | 4,480 |
| Dbl B2 8'H | 13 | EA | 1,060.00 | 13,780 |
| Sgl C1 7'H | 6 | EA | 610.00 | 3,660 |
| Sgl C1 8'H | 105 | EA | 635.00 | 66,675 |
| Dbl C2 8'H | 9 | EA | 1,270.00 | 11,430 |
| Dbl C3 8'H | 1 | EA | 1,240.00 | 1,240 |
| | | | | 159,225 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 083100 ACCESS DOORS AND PANELS | | | | |
| Partitions: | | | | |
| Access panels | 1 | LS | 30,000.00 | 30,000 |
| | | | | 30,000 |
| 083323 SPECIAL DOORS | | | | |
| Interior Doors: | | | | |
| Café/Learning Common: | | | | |
| Coiling Security Mesh Drape ( 21'x 8' -2EA | 336 | SF | 95.00 | 31,920 |
| Servery : | | | | |
| Coiling Security Mesh Drape ( 40'x 8' -1EA | 320 | SF | 95.00 | 30,400 |
| Main office: | | | | |
| Coiling Security Mesh Drape ( 21' x 5' 6"-1 | 116 | SF | 95.00 | 10,973 |
| Exterior Doors: | | | | |
| Motor Operated Insulated OH Door: | | | | |
| Tech-Makerspace (10'x10'6" ) | 1 | EA | 7,500.00 | 7,500 |
| | | | | 80,793 |
| 084513 STRUCT-POLYCARBONATE PNL ASSEMB. & SKYLIGHTS | | | | |
| Roof Coverings: | | | | |
| Main Entrance Canopy -Complete: | | | | |
| Clear Polycarb glazing w/ alum struct -7'w | 416 | SF | 175.00 | 72,800 |
| Roof Openings: | | | | |
| Gable Skylight ( 4 loc) | 4,261 | SF | 140.00 | 596,540 |
| Gable Skylight End wall ( 8 loc) | 427 | SF | 140.00 | 59,780 |

*Includes Section 086300

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | --- |
| | | | | 729,120 |
| 087100 DOOR HARDWARE | | | | |
| Exterior Doors | | | | |
| Hardware Set @ Ext. Alum Door: | | | | |
| 1 | 1 | EA | 750.00 | 750 |
| 2 | 1 | EA | 825.00 | 825 |
| 3 | 3 | EA | 2,250.00 | 6,750 |
| 4 | 2 | EA | 2,300.00 | 4,600 |
| 5 | 1 | EA | 3,850.00 | 3,850 |
| SGL -allow | 2 | EA | 2,500.00 | 5,000 |
| 9 | 1 | EA | 1,425.00 | 1,425 |
| 11 | 1 | EA | 5,900.00 | 5,900 |
| 12 | 1 | EA | 6,300.00 | 6,300 |
| Terrace - sgl | -1 | EA | 2,000.00 | -2,000 |
| Terrace - dbl | -1 | EA | 4,000.00 | -4,000 |
| Entry - sgl | 1 | EA | 4,000.00 | 4,000 |
| Hardware Set # Ext HM Door: | | | | |
| 6 | 1 | EA | 1,150.00 | 1,150 |
| 8 | 3 | EA | 2,925.00 | 8,775 |
| 10 | 2 | EA | 4,500.00 | 9,000 |
| 13 | 1 | EA | 2,475.00 | 2,475 |
| 14 | 3 | EA | 2,325.00 | 6,975 |
| 16 | 1 | EA | 750.00 | 750 |
| 17 | 1 | EA | 3,350.00 | 3,350 |
| 18 | 1 | EA | 1,400.00 | 1,400 |
| 19 | 1 | EA | 5,100.00 | 5,100 |
| *Hardware also included with 080001 | | | | |
| Interior Doors: | | | | |
| Hardware Set @ Int. Alum Door: | | | | |
| 15 | 5 | EA | 5,425.00 | 27,125 |
| Hardware Set @ Typ Int. Doors ( per Spec ): | | | | |
| 20 | 1 | EA | 1,500.00 | 1,500 |
| 22 | 2 | EA | 785.00 | 1,570 |
| 23 | 1 | EA | 805.00 | 805 |
| 24 | 13 | EA | 695.00 | 9,035 |
| 25 | 2 | EA | 485.00 | 970 |
| 26 | 1 | EA | 460.00 | 460 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 27 | 2 | EA | 590.00 | 1,180 |
| 28 | 23 | EA | 670.00 | 15,410 |
| 29 | 10 | EA | 510.00 | 5,100 |
| 30 | 44 | EA | 585.00 | 25,740 |
| 31 | 1 | EA | 480.00 | 480 |
| 32 | 39 | EA | 680.00 | 26,520 |
| 33 | 1 | EA | 510.00 | 510 |
| 34 | 1 | EA | 510.00 | 510 |
| 35 | 1 | EA | 810.00 | 810 |
| 36 | 12 | EA | 810.00 | 9,720 |
| 37 | 1 | EA | 910.00 | 910 |
| 38 | 2 | EA | 835.00 | 1,670 |
| 39 | 1 | EA | 835.00 | 835 |
| 40 | 49 | EA | 985.00 | 48,265 |
| 41 | 18 | EA | 835.00 | 15,030 |
| 42 | 2 | EA | 1,785.00 | 3,570 |
| 43 | 5 | EA | 785.00 | 3,925 |
| 44 | 1 | EA | 805.00 | 805 |
| 45 | 1 | EA | 1,835.00 | 1,835 |
| 46 | 6 | EA | 2,005.00 | 12,030 |
| 47 | 1 | EA | 3,085.00 | 3,085 |
| 48 | 2 | EA | 1,470.00 | 2,940 |
| 49 | 1 | EA | 885.00 | 885 |
| 50 | 1 | EA | 1,045.00 | 1,045 |
| 51 | 3 | EA | 1,345.00 | 4,035 |
| 52 | 1 | EA | 1,415.00 | 1,415 |
| 53 | 5 | EA | 1,665.00 | 8,325 |
| 54 | 3 | EA | 1,485.00 | 4,455 |
| 55 | 2 | EA | 1,135.00 | 2,270 |
| 56 | 3 | EA | 2,790.00 | 8,370 |
| 57 | 2 | EA | 1,945.00 | 3,890 |
| 58 | 1 | EA | 4,270.00 | 4,270 |
| 59 | 1 | EA | 4,465.00 | 4,465 |
| 60 | 1 | EA | 4,445.00 | 4,445 |
| 61 | 2 | EA | 4,610.00 | 9,220 |
| 62 - Coiling dr | | w/Unit Cost | | |
| Toilet rm - multi user | 12 | EA | 1,200.00 | 14,400 |
| Storage rm - sgl | 1 | EA | 550.00 | 550 |
| | | | | 366,760 |

089000 LOUVERS & VENTS

| | | | | |
|---|---|---|---|---|
| Exterior Windows: | | | | |
| Vert Alum louver w/damper (RFI #17) | 660 | SF | 125.00 | 82,500 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Roof Openings: | | | | |
| Elevator vent | 1 | EA | 1,500.00 | 1,500 |
| | | | | 84,000 |
| DIVISION 09 - FINISHES | | | | |
| 090003 TILE* | | | | |
| *Noted 5'6" on A441 | | | | |
| Wall Finishes: | | | | |
| Drinking Fountain Alcove (7 loc): | | | | |
| Ceramic wall tile 6'h | 405 | SF | 35.00 | 14,175 |
| Multi User Toilet Rm (16 EA) | | | | |
| Ceramic wall tile 6'h | 1,355 | SF | 23.00 | 31,165 |
| Sgl User Toilet Rm (15 EA): | | | | |
| Ceramic wet wall tile 6'h | 835 | SF | 23.00 | 19,205 |
| 1/4" Stl plate @ tile - 6" w (10/A620) | 1 | LS | 30,000.00 | 30,000 |
| *Tile includes alum trim | | | | |
| Tile Backer Bd Premium | 2,595 | SF | 1.85 | 4,801 |
| Floor Finishes: | | | | |
| Café/Learning Commons: | | | | |
| Porcelain tile | 5,583 | SF | 24.00 | 133,992 |
| Anti-fracture membrane | 5,583 | SF | 6.00 | 33,498 |
| Quarry Tile: | | | | |
| Kitchen / servery | 1,654 | SF | 17.25 | 28,532 |
| Wall base | 290 | LF | 9.75 | 2,828 |
| Anti-fracture membrane | 1,654 | SF | 6.00 | 9,924 |
| | | | | 308,119 |
| 090006 RESILIENT FLOORING* | | | | |
| Floor Finishes: | | | | |
| Moisture mitigation -spec | 46,242 | SF | 1.00 | 46,242 |
| LT-linoleum tile TYP | 59,665 | SF | 5.00 | 298,325 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| LP - linoleum plank Corridor | 28,786 | SF | 6.50 | 187,109 |
| LP - linoleum plank breakout area | | w/ corr. | | |
| Acoustical Mat - nr 99 (2nd & 3rd flr) | 40,000 | SF | 2.50 | 100,000 |
| *Includes sections 0965000 & 096513 | | | | |
| Wall Finishes: | | | | |
| Wall base 12" VCT tile w/ Schluter top edg | 28,500 | LF | 6.50 | 185,250 |
| Wall base 6" @ locker box | 1,050 | LF | 5.00 | 5,250 |
| Typ resilient wall base - allow | 1 | LS | 7,500.00 | 7,500 |
| Stair Finishes: | | | | |
| Metal Pan Stair Learning Commons Stair ( 4 FLT): | | | | |
| VCT tile landing | 172 | SF | 8.00 | 1,376 |
| VCT treads & risers w/rub nosing | 678 | LFR | 14.25 | 9,662 |
| Aud Stair Finish | | W/ C1030 | | |
| | | | | 840,714 |
| 090009 PAINTING* | | | | |
| Exterior Walls: | | | | |
| Misc exterior painting -allow | 1 | LS | 10,000.00 | 10,000 |
| Exterior Doors: | | | | |
| Paint HM door & Frame - sgl | 5 | EA | 120.00 | 600 |
| Paint HM door & Frame - dbl | 9 | EA | 225.00 | 2,025 |
| Interior Doors: | | | | |
| Paint Int HM door frame: | | | | |
| Single Door 7'H | 22 | EA | 125.00 | 2,750 |
| Double Door 7'H | 1 | EA | 145.00 | 145 |
| Single Door 8' H | 251 | EA | 140.00 | 35,140 |
| Double door 8'H | 26 | EA | 160.00 | 4,160 |
| Paint Int HM door: | | | | |
| Sgl B1 7'H | 15 | EA | 150.00 | 2,250 |
| 90 Min Sgl B1 7'H | 1 | EA | 150.00 | 150 |
| Dbl B2 7'H | 1 | EA | 300.00 | 300 |
| Sgl B1 8'H | 25 | EA | 175.00 | 4,375 |
| 90 Min Sgl B1 8'H | 1 | EA | 175.00 | 175 |
| 90 Min Dbl B2 8'H | 3 | EA | 300.00 | 900 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Roof Construction: | | | | |
| Intumescent paint - roof struct. | 1 | LS | 75,000.00 | 75,000 |
| *Exposed structure @ atrium noted | | | | |
| *Includes Section 099646 | | | | |
| Stair Finishes: | | | | |
| Paint Metal Pan Stair & Rail: | | | | |
| 5' W @ Learning Commons 1st- 3rd | 2 | FLTS | 2,500.00 | 5,000 |
| 8' W @ Learning Commons 1st- 2nd | 2 | FLTS | 2,750.00 | 5,500 |
| 5' W @ Stair Hall | 5 | FLTS | 2,500.00 | 12,500 |
| Seal Concrete Finish: | | | | |
| 5' W @ Stair Hall | 5 | FLTS | 2,000.00 | 10,000 |
| Wall Finishes: | | | | |
| Interior painting- walls | 136,600 | GSF | 1.90 | 259,540 |
| Floor Finishes: | | | | |
| SC Sealed Concrete Floor Finish (030513): | | | | |
| Storage, mech, elec & receiving | 5,561 | SF | 2.00 | 11,122 |
| Ceiling Finishes: | | | | |
| Paint gyp ceiling | 45,000 | SF | 1.00 | 45,000 |
| Paint gyp soffits | 1 | LS | 25,000.00 | 25,000 |
| Paint exposed structure- 100%: | | | | |
| Class Small Closet( 34 loc) | 408 | SF | 2.00 | 816 |
| Typ mech, elec & storage rm | 5,759 | SF | 2.00 | 11,518 |
| Auditorium & stage | 5,996 | SF | 2.50 | 14,990 |
| Main gym deck | 8,268 | SF | 4.00 | 33,072 |
| Typ, Sci, Art, Music, & Media - exp deck | 23,986 | SF | 2.00 | 47,972 |
| Stair hall | 1,203 | SF | 2.00 | 2,406 |
| | | | | 622,406 |
| 092116 GYPSUM WALLBOARD ASSEMBLIES | | | | |
| Exterior Walls: | | | | |
| 1 lyr 5/8" gyp @ stud | 43,553 | SF | 3.25 | 141,547 |
| Exterior Walls: | | | | |
| Exterior wall Backup: | | | | |
| 10" x 16 Ga. stud @ Typ 14' | 41,075 | SF | 11.70 | 480,578 |
| 10" x 16 Ga. stud @ raised common 5-6'h | 2,486 | SF | 11.70 | 29,086 |
| Entry pier/chimney framing-14'H | 668 | SF | 9.85 | 6,580 |
| 1/2" Dens glass sheathing | 44,229 | SF | 3.30 | 145,956 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| * Mech Penthouse Unit - Complete | | W / HVAC | | |
| Ext Ceiling Framing @ : | | | | |
| Canopy & covered entry | 1,056 | SF | 6.50 | 6,864 |
| 1/2" Dens glass sheathing | 1,056 | SF | 3.50 | 3,696 |
| Partitions: | | | | |
| H6 Elevator shaft - 56'6"H | 2,095 | SF | 18.00 | 37,710 |
| C4 Auditorium -28'H | 952 | SF | 18.00 | 17,136 |
| C7 Auditorium - 28'H | 4,755 | SF | 18.00 | 85,590 |
| Stage front | 120 | SF | 9.00 | 1,080 |
| F1 gym storage -28'H | 695 | SF | 18.00 | 12,510 |
| F1 gym storage chase 1 side -28'H | 105 | SF | 16.00 | 1,680 |
| 1 side class radial mech chase 14'H | 7,318 | SF | 12.00 | 87,816 |
| Chase @ fnd wall14'H | 996 | SF | 10.00 | 9,960 |
| Drinking fountain chase wing wall14'H | 689 | SF | 10.00 | 6,890 |
| D6 & D6 Bulkhead @ dbl op part - 6'H | 114 | SF | 15.00 | 1,710 |
| Curb 1'H @ glazed part | 866 | SF | 15.00 | 12,990 |
| Bulkhead 6'H @ glazed part | 5,196 | SF | 12.00 | 62,352 |
| F6 Bulkhead @ op part - 6'H | 1,248 | SF | 12.00 | 14,976 |
| B1 Atrium shaft 2nd - high roof | 4,107 | SF | 16.50 | 67,766 |
| TYP -14' Drywall Partitions: | | | | |
| B1 | 1,621 | SF | 9.15 | 14,832 |
| B3 | 417 | SF | 10.15 | 4,233 |
| B4 | 4,116 | SF | 12.15 | 50,009 |
| C2 | 5,578 | SF | 14.65 | 81,718 |
| C3 | 9,149 | SF | 14.65 | 134,033 |
| C4 | 2,589 | SF | 14.65 | 37,929 |
| C6 | 3,620 | SF | 16.90 | 61,178 |
| C7 | 1,112 | SF | 14.65 | 16,291 |
| C8 | 181 | SF | 19.40 | 3,511 |
| C10 | 229 | SF | 16.90 | 3,870 |
| D3 | 1,429 | SF | 12.65 | 18,077 |
| D6 | 455 | SF | 14.90 | 6,780 |
| E3 | 10,614 | SF | 17.15 | 182,030 |
| E4 | 580 | SF | 17.15 | 9,947 |
| E6 | 1,181 | SF | 19.40 | 22,911 |
| E7 | 894 | SF | 24.15 | 21,590 |
| E8 | 18,658 | SF | 21.90 | 408,610 |
| E9 | 2,588 | SF | 21.90 | 56,677 |
| F1 | 4,933 | SF | 19.65 | 96,933 |
| F2 | 2,142 | SF | 21.90 | 46,910 |
| F6 | 4,592 | SF | 19.65 | 90,233 |
| F8 | 775 | SF | 24.40 | 18,910 |
| H4 | 1,232 | SF | 14.65 | 18,049 |
| J1 | 7,734 | SF | 19.30 | 149,266 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| J2 | 596 | SF | 16.40 | 9,774 |
| K1 | 7,317 | SF | 23.80 | 174,145 |
| K2 | 1,724 | SF | 23.80 | 41,031 |
| GWB @ Corridor Locker Enclosure (nic mtl locker) & Rails - allow: | | | | |
| Freestanding locker box - 1st flr | 307 | LF | 60.00 | 18,420 |
| Freestanding - locker box upper flr w/ soff | 724 | LF | 120.00 | 86,880 |
| Upper flr guardrail w/ soffit (6/A650) | 327 | LF | 55.00 | 17,985 |
| Cohort # 2059 2nd flr guard rail w/soffit(6/ | 19 | LF | 55.00 | 1,045 |
| Additional framing @ sloped AWP (A601) | 10,700 | SF | 7.50 | 80,250 |
| (5/A601) frame AV monitor box | 65 | EA | 100.00 | 6,500 |
| Tile Backer Bd Premium | | W / TILE FSB | | |
| Impact resis. Gwb premium | 1 | LS | 50,000.00 | 50,000 |
| Misc. GWB assemblies (inc extruded alum | 136,600 | GSF | 0.50 | 68,300 |
| Load, Distribute and Misc. | 136,600 | GSF | 0.50 | 68,300 |
| *Partitions include sound attenuation, tape & joint compound finish | | | | |
| Ceiling Finishes: | | | | |
| Acoustical Gypsum Plaster (092313): | | | | |
| Clg spray sys - allow | 1 | LS | TBD | |
| Typ, Sci, Art, Music, SPED & ELL Classroom CLG & Soffits: | | | | |
| Summer Beam bottom 3'W (1/A690) | 3,530 | SF | 20.00 | 70,600 |
| Summer Beam light cove & vert framing (1 | 2,354 | LF | 150.00 | 353,100 |
| Typ. gyp clg bay | 1,161 | SF | 15.00 | 17,415 |
| Complete soffit @ gyp bay | 326 | LF | 48.00 | 15,648 |
| Complete beam box 11'6" bot | 998 | LF | 80.00 | 79,840 |
| Sloped ACT clg - metal deck transition sol | 1,365 | LF | 32.00 | 43,680 |
| Complete soffit @ OP partition class (6/A601) | | N/A | | |
| Central Corridor CLG & Soffits: | | | | |
| Horiz gyp clg 8'AFF | 6,049 | SF | 14.00 | 84,686 |
| Horiz gyp clg 12'AFF | 2,735 | SF | 14.00 | 38,290 |
| (9/A690) Soffit @ bot of sloped ACT | 1,852 | LF | 35.00 | 64,820 |
| (8/A690) Soffit @ top of sloped ACT | 1,852 | LF | 45.00 | 83,340 |
| (7/A650) Cap @ locker box | 565 | LF | 50.00 | 28,250 |
| (6/A650) Soffit @ guardrail | 367 | LF | 50.00 | 18,350 |
| Misc. Soffits @: | | | | |
| Toilet rm light cove (7/A690) | 570 | LF | 65.00 | 37,050 |
| ACT - GWB transition 8" AFF | 75 | LF | 32.00 | 2,400 |
| Pyramid Skylight 2'H | 1,134 | SF | 45.00 | 51,030 |
| Gyp Ceiling System : | | | | |
| Atrium 3rd flr sloped gyp clg | 4,700 | SF | 30.00 | 141,000 |
| Typ gyp ceiling | 1,917 | SF | 15.00 | 28,755 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Emergency shw gyp clg | 54 | SF | 15.00 | 810 |
| 1 Hr gyp mech/elec | 474 | SF | 15.00 | 7,110 |
| 2Hr gyp mech/elec | 169 | SF | 22.00 | 3,718 |
| A651 Underside monumental Stair w/ retur | 800 | SF | 21.00 | 16,800 |
| Underside proj rm/bridge | 600 | SF | 21.00 | 12,600 |
| Sub acoustical clg (2/A690) | 5,296 | SF | 24.00 | 127,104 |
| Breakout rm sloped gyp clg 50% | 2,000 | SF | 16.00 | 32,000 |
| Toilet/shw rm (3 loc) | 438 | SF | 12.00 | 5,256 |
| Partitions: | | | | |
| **Breakout 3,400 GSF** | | | | |
| Breakout Floor Framing -Allow: | | | | |
| Light gauge floor | 1,600 | SF | 20.00 | 32,000 |
| 9/16" Metal Deck | 1,600 | SF | 4.00 | 6,400 |
| Concrete Deck fill | w/ package #2 | | | |
| Breakout A( 2 story): | | | | |
| P lam wall finish -allow | 54 | SF | 55.00 | 2,970 |
| Typ GWB wall -sgl stud | 900 | SF | 25.00 | 22,500 |
| GWB chase wall-complete | 978 | SF | 25.00 | 24,450 |
| GWB roof | 260 | SF | 25.00 | 6,500 |
| Breakout B( 3 story): | | | | |
| P lam wall finish -allow | 74 | SF | 55.00 | 4,070 |
| GWB chase wall-complete | 2,688 | SF | 25.00 | 67,200 |
| GWB roof | 300 | SF | 25.00 | 7,500 |
| Breakout C( 2 story w/ guard rail 3rd flr): | | | | |
| P lam wall finish -allow | 150 | SF | 55.00 | 8,250 |
| Typ GWB wall -sgl stud | 1,034 | SF | 25.00 | 25,850 |
| GWB chase wall-complete | 1,038 | SF | 25.00 | 25,950 |
| Typ GWB knee wall -sgl stud | 42 | SF | 25.00 | 1,050 |
| GWB chase knee wall-complete | 107 | SF | 25.00 | 2,675 |
| Cap @ knee wall walls | 44 | LF | 25.00 | 1,100 |
| Breakout D( 1 story): | | | | |
| P lam wall finish -allow | 50 | SF | 55.00 | 2,750 |
| Typ GWB wall -sgl stud | 771 | SF | 25.00 | 19,275 |
| GWB roof | 205 | SF | 25.00 | 5,125 |
| Breakout E ( 1 story): | | | | |
| P lam wall finish -allow | 47 | SF | 55.00 | 2,585 |
| Typ GWB wall -sgl stud | 611 | SF | 25.00 | 15,275 |
| GWB chase wall-complete | 286 | SF | 25.00 | 7,150 |
| GWB roof | 292 | SF | 25.00 | 7,300 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | --- |
| | | | | 5,073,206 |
| 095100 ACOUSTICAL CEILINGS* | | | | |
| A1 2'x2'and 4' x 3/4"ACT Ceiling System @ : | | | | |
| A1 Typ ACT | 2,525 | SF | 9.00 | 22,725 |
| A1 Splayed ACT (20%) | 1,870 | SF | 8.25 | 15,428 |
| A2 2'x2'and 4' x 5/8"ACT Ceiling System @ : | | | | |
| A2 Typ ACT | 6,546 | SF | 8.25 | 54,005 |
| A2 Splayed ACT (20%) | 20,732 | SF | 8.25 | 171,039 |
| A2 Breakout rooms (50%) | 1,715 | SF | 10.00 | 17,150 |
| A 3 ACT 2 x 2 | | N/A | | |
| A 4 Kitchen / servery | 1,688 | SF | 6.75 | 11,394 |
| Random Size Ultima: | | | | |
| Corridor 8'w | 13,564 | SF | 10.00 | 135,640 |
| Exterior Soffit panel | | W /Ext Wall | | |
| *Includes Sections 095100 & 095133 | | | | |
| | | | | --- |
| | | | | 427,380 |
| 096446 WOOD & ATHLETIC FLOORING | | | | |
| Floor Finishes: | | | | |
| Main Gym: | | | | |
| Moisture mitigation -(vapor retarder) | 8,276 | SF | 4.75 | 39,311 |
| Wood Maple Gym flooring | 8,276 | SF | 19.00 | 157,244 |
| Vented wall base | 365 | LF | 9.85 | 3,595 |
| Auditorium (8/A602) - Finish Carp Spec: | | | | |
| Stage flooring - 4" assembly | 1,540 | SF | 14.00 | 21,560 |
| Stage nosing | 59 | LF | 38.00 | 2,242 |
| Stage wall base /transition | 113 | LF | 9.85 | 1,113 |
| *Includes Sections 096429 & 096466 | | | | |
| | | | | --- |
| | | | | 225,065 |
| 096712 RESINOUS FLOORING | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Floor Finishes: | | | | |
| SGL User Toilet Room (15 EA) : | | | | |
| Epoxy flr w/int base | 997 | SF | 18.00 | 17,946 |
| Shw receptor 3x3 | 1 | EA | 550.00 | 550 |
| Shw receptor 5x3 | 2 | EA | 700.00 | 1,400 |
| Threshold/transition | 15 | EA | 200.00 | 3,000 |
| Multi User Toilet & Locker Room( 18 EA): | | | | |
| Epoxy flr w/int base | 4,601 | SF | 18.00 | 82,818 |
| Threshold/transition | 18 | EA | 200.00 | 3,600 |
| | | | | 109,314 |
| 096800 CARPET | | | | |
| Floor prep | 1,033 | SF | 0.25 | 258 |
| Floor Finishes: | | | | |
| Auditorium: | | | | |
| Carpet aisle | 1,033 | SF | 6.00 | 6,198 |
| Carpet aisle stair/stage (4 riser) | 4 | FLT | 500.00 | 2,000 |
| | | | | 8,456 |
| 097217 DIGITAL IMAGE WALL COVERINGS | | | | |
| Wall Finish: | | | | |
| Mural - Digital image wall covering - install only w/ 1 /2" GWB Back up: | | | | |
| Media center | 1,400 | SF | 15.00 | 21,000 |
| Main office | 50 | SF | 50.00 | 2,500 |
| | | | | 23,500 |
| 097233 DRY-ERASE WALL COVERING | | | | |
| Wall Finish: | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Dry Erase Wall Finish | 6,640 | SF | 25.00 | 166,000 |
| | | | | 166,000 |
| 097733 SANITARY WALL PANELS | | | | |
| Wall Finish: | | | | |
| 8' FRP Wall Panel -allow: | | | | |
| Main kitchen | 2,233 | SF | 9.75 | 21,772 |
| | | | | 21,772 |
| 098100 ACOUSTICAL INSULATION | | w/092116 | | |
| | | | | 0 |
| 098400 ACOUSTIC ROOM COMPONENTS | | | | |
| Wall Finish: | | | | |
| Fabric Wrapped Acoustical Panels 1": | | | | |
| Media ctr | 1,260 | SF | 32.00 | 40,320 |
| Science Lab Classroom (260 SF /6 EA) | 1,560 | SF | 32.00 | 49,920 |
| Makerspace ( 1 EA) | 224 | SF | 32.00 | 7,168 |
| Fab-lab ( 1 EA) | 250 | SF | 32.00 | 8,000 |
| Art Class Room ( 1 EA) | 300 | SF | 32.00 | 9,600 |
| Teacher Prep Room ( 24 EA) | | N/A | | |
| Typ, SPED & ELL Classroom 206SF / 32 | 6,592 | SF | 32.00 | 210,944 |
| Drama Classroom ( 1 EA) | 300 | SF | 32.00 | 9,600 |
| Band Rm ( 1 EA) | 912 | SF | 32.00 | 29,184 |
| Chorus Classroom ( 1 EA) | 309 | SF | 32.00 | 9,888 |
| Guidance Suite (133 SF /3 Loc) | 399 | SF | 32.00 | 12,768 |
| Break out areas | | NIC | | |
| Auditorium | | NIC | | |
| | | | | 387,392 |
| 098415 WOOD FIBER ACOUSTICAL PANELS | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Wall Finish: | | | | |
| Cementitious Wood Fiber Wall Panel: | | | | |
| Music practice rm ( 3 EA) | 409 | SF | 19.00 | 7,771 |
| Band Rm ( 1 EA) | 833 | SF | 19.00 | 15,827 |
| Gymnasium | 4,344 | SF | 19.00 | 82,536 |
| | | | | --- |
| | | | | 106,134 |

DIVISION 10 - SPECIALTIES

101100 MARKERBOARDS & TACKBOARDS

| | | | | |
|---|---|---|---|---|
| Fittings: | | | | |
| Allow: | | | | |
| Media center tack surfaces | 100 | SF | 28.00 | 2,800 |
| 4'H Tack Board | 30 | EA | 400.00 | 12,000 |
| *Dry-erase magnetic wall covering is included in C3010 | | | | |
| | | | | --- |
| | | | | 14,800 |

101400 SIGNAGE

| | | | | |
|---|---|---|---|---|
| Exterior Walls: | | | | |
| Ext. Signage: | | | | |
| 18" Cast bronze letter (1 loc) - chimney | 6 | EA | 650.00 | 3,900 |
| Cast lettering @ entry ramp | 18 | EA | 500.00 | 9,000 |
| Misc. bldg mtd signage -allow | 1 | LS | 20,000.00 | 20,000 |
| Fittings | | | | |
| Allow: | | | | |
| Building directory | 1 | EA | 5,000.00 | 5,000 |
| Dedication plaque | 1 | EA | 3,800.00 | 3,800 |
| Room ID sign | 136,600 | GSF | 0.22 | 30,052 |
| Misc Int. ADA signage | 136,600 | GSF | 0.12 | 16,392 |
| | | | | --- |
| | | | | 88,144 |

102113 TOILET COMPARTMENTS

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Fittings: | | | | |
| HDPE Toilet Partitions: | | | | |
| Std. partition | 23 | EA | 1,220.00 | 28,060 |
| HC partition | 16 | EA | 1,430.00 | 22,880 |
| Urinal screen | 15 | EA | 310.00 | 4,650 |
| | | | | 55,590 |

102600 WALL AND DOOR PROTECTION

| | | | | |
|---|---|---|---|---|
| Fittings: | | | | |
| Vinyl/Acrylic Composite: | | | | |
| Corner guard | 1 | LS | 5,000.00 | 5,000 |
| Crash rail | 1 | LS | 5,000.00 | 5,000 |
| | | | | 10,000 |

102813 TOILET ACCESSORIES

| | | | | |
|---|---|---|---|---|
| Fittings: | | | | |
| SGL User Toilet Rm Accessories ( 15 ea): | | | | |
| Tilt mirror @ wall hung lav | 15 | EA | 220.00 | 3,300 |
| Soap dispenser (owner furnish & installed) | | NIC | | |
| Toilet tissue dispenser | 15 | EA | 48.00 | 720 |
| San. prod. disposal | 15 | EA | 60.00 | 900 |
| Toilet grab bars | 30 | EA | 85.00 | 2,550 |
| Paper towel dispenser-allow | 15 | EA | 135.00 | 2,025 |
| Waste receptacle | 15 | EA | 150.00 | 2,250 |
| Elec hand dryer - allow | | NIC | | |
| Coat hook | 15 | EA | 25.00 | 375 |
| Fixed diaper changing sta - allow | 3 | EA | 550.00 | 1,650 |
| 3' ADA SHW accessories -allow | 1 | EA | 550.00 | 550 |
| Multi User Toilet & Locker Rm Accessories (16 ea): | | | | |
| Soap dispenser (owner furnish & installed) | | NIC | | |
| Toilet tissue dispenser | 39 | EA | 48.00 | 1,872 |
| San. prod. disposal | 27 | EA | 60.00 | 1,620 |
| Toilet grab bars | 32 | EA | 85.00 | 2,720 |
| Paper towel dispenser- 2/rm | 32 | EA | 135.00 | 4,320 |
| Waste receptacle - 2/rm | 32 | EA | 150.00 | 4,800 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Elec hand dryer - allow | | NIC | | |
| Coat hook | 39 | EA | 25.00 | 975 |
| 5' ADA shw accessories - allow | 2 | EA | 550.00 | 1,100 |
| Dressing Rm Accessories (2 ea): | | | | |
| Soap dispenser (owner furnish & installed) | | NIC | | |
| Allow: | | | | |
| Misc. locker rm accessories | 2 | EA | 1,000.00 | 2,000 |
| Janitor shelf/mop holder | 7 | EA | 200.00 | 1,400 |
| *Excludes classroom and workroom accessories | | | | |
| | | | | 35,127 |

104000 SAFETY SPECIALTIES

| | | | | |
|---|---|---|---|---|
| Fittings: | | | | |
| Safety Specialties : | | | | |
| Hose connection cabinet | 16 | EA | 350.00 | 5,600 |
| First aid kit (nic sci rm) | 6 | EA | 450.00 | 2,700 |
| Fire Dept key cab | 2 | EA | 1,000.00 | 2,000 |
| Fire extinguisher and cab (nic sci rm) | 20 | EA | 475.00 | 9,500 |
| AED & cabinets | 4 | EA | 750.00 | 3,000 |
| *See also science equipment | | | | |
| | | | | 22,800 |

107113 EXTERIOR SUN CONTOL DEVICES

| | | | | |
|---|---|---|---|---|
| Allow (per Spec) | 1 | LS | 75,000.00 | 75,000 |
| | | | | 75,000 |

109000 MISCELLANEOUS SPECIALTIES

Exterior Walls:

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| LVL 2 entry flagpole 34' H | 1 | EA | 9,000.00 | 9,000 |
| Fittings: | | | | |
| Phenolic Locker-Allow: | | | | |
| 15" wx12"dx36"H corridor (nic enclosure) | 660 | EA | 415.00 | 273,900 |
| Metal Locker: | | | | |
| 15"w x 15"d x 30"H PE student 2 tiered | 40 | EA | 215.00 | 8,600 |
| 15"w x 15"d - Custodian/kitchen staff db | 6 | EA | 265.00 | 1,590 |
| 12" Kitchen staff dbl tier | 3 | EA | 265.00 | 795 |
| Locker base @ : | | | | |
| Student corridor | | W /Enclosure | | |
| PE student | 50 | LF | 36.00 | 1,800 |
| PE staff | 9 | LF | 36.00 | 324 |
| Free Standing Wood Bench: | | | | |
| PE locker rm (2 EA) | 12 | LF | 125.00 | 1,500 |
| Health office cubicle track w/ curtain | 3 | EA | 1,325.00 | 3,975 |
| Safety Specialties (104000): | | | | |
| Hose connection cabinet | 16 | EA | 350.00 | 5,600 |
| First aid kit (nic sci rm) | 6 | EA | 450.00 | 2,700 |
| Fire Dept key cab | 2 | EA | 1,000.00 | 2,000 |
| Fire extinguisher and cab (nic sci rm) | 20 | EA | 475.00 | 9,500 |
| AED & cabinets | 4 | EA | 750.00 | 3,000 |
| *See also science equipment | | | | |
| Secure wall panels-Allow: | | | | |
| OT/PT rm (1 ea) | 320 | SF | 15.00 | 4,800 |
| Padded athletic flr tiles - allow: | | | | |
| OT/PT rm (1 ea) | 100 | SF | 15.00 | 1,500 |
| Partitions: | | | | |
| Folding Panel partition: | | | | |
| 16' x 8' H Typ classroom (13 EA) | 1,664 | SF | 110.00 | 183,040 |
| (22/A620)Dbl 19' x 8'H Music rm acoustic | 152 | SF | 110.00 | 16,720 |
| 8' H SPED suite (3 LOC) | 960 | SF | 110.00 | 105,600 |
| *Includes pass dr & white bd finish | | | | |
| *Includes Sections 102123, 102239, 105113, 105123 & 107113 | | | | |
| | | | | --- |
| | | | | 635,944 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 11 - EQUIPMENT | | | | |
| 113100 RESIDENTIAL APPLIANCES | | | | |
| Custodian Storage Rm #1216: | | | | |
| Stack washer/dryer | 1 | EA | 2,500.00 | 2,500 |
| Custodian Office/Break Rm (1 EA): | | | | |
| Refrigerator -full size | 1 | EA | 1,400.00 | 1,400 |
| Staff Dinning Rm ( 1 ea): | | | | |
| Refrigerator -full size | 1 | EA | 1,400.00 | 1,400 |
| Medical Suite: | | | | |
| Refrigerator -full size | 1 | EA | 1,400.00 | 1,400 |
| SPED Classroom 1260 (12/A410): | | | | |
| Range | 1 | EA | 750.00 | 750 |
| Refrigerator | 1 | EA | 1,400.00 | 1,400 |
| Washer | 1 | EA | 1,500.00 | 1,500 |
| Range hood | | NIC | | |
| Dryer | | NIC | | |
| Dishwasher | | NIC | | |
| Kitchen washer and dryer | W / Kitchen Equipment | | | |
| Science rm appliance | W / Science Equipment | | | |
| | | | | 10,350 |
| 114000 FOOD SERVICE EQUIPMENT | | | | |
| Kitchen equipment & casework | 1 | LS | 415,270.00 | 415,270 |
| *Kitchen equipment & casework Quote 7/19/2019 | | | | |
| | | | | 415,270 |
| 115213 PROJECTION SCREENS | | | | |
| Projection Screen - Elec Op. - Allow: | | | | |
| 18' auditorium (spec) | 1 | EA | 15,000.00 | 15,000 |
| 18' Café/Learning commons (clg plan) | 1 | EA | 15,000.00 | 15,000 |
| 18' Gym - allow | 1 | EA | 15,000.00 | 15,000 |
| Media center (spec) | 2 | EA | 10,000.00 | 20,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | --- |
| | | | | 65,000 |
| 116143 THEATRICAL EQUIPMENT(No Spec) | | | | |
| Auditorium (6/28/2019 Quote 420 Seat)- Allow: | | | | |
| Theatrical Rigging | 1 | LS | 158,300.00 | 158,300 |
| Theatrical Draperies | 1 | LS | 33,854.00 | 33,854 |
| Theatrical Lighting Instruments & Access. | 1 | LS | 129,018.00 | 129,018 |
| Theatrical Lighting Control System | 1 | LS | 95,749.00 | 95,749 |
| Technology and Local Sound: | | | | |
| Gym | 1 | EA | 120,000.00 | 120,000 |
| Café | 1 | LS | 50,000.00 | 50,000 |
| Aud Audio Visual System | 1 | LS | 200,000.00 | 200,000 |
| Band and Chorus Class | 1 | LS | 60,000.00 | 60,000 |
| Drama Class | 1 | LS | 20,000.00 | 20,000 |
| | | | | --- |
| | | | | 866,921 |
| 116600 ATHLETIC & SPORTS EQUIPMENT | | | | |
| Main Gym: | | | | |
| Basketball backstops - electric | 6 | EA | 9,500.00 | 57,000 |
| Wall padding | 861 | SF | 17.00 | 14,637 |
| Motor op divider curtain (51'x24')-allow | 1,224 | SF | 16.00 | 19,584 |
| Volley ball court equip. | 2 | PR | 700.00 | 1,400 |
| Scoreboard (2 EA Spec 116643) | W / Electrical | | | |
| Wall Mtd Motor op Bleacher (qty noted) | 650 | SEAT | 85.00 | 55,250 |
| Batting cage (not shown) | 1 | EA | 10,000.00 | 10,000 |
| *Includes Sections 116623 - 116653 | | | | |
| | | | | --- |
| | | | | 157,871 |
| 119000 MISC. EQUIPMENT | | | | |
| Allow -Science Lab Classroom Equipment ( 6 EA): | | | | |
| Safety glasses monitor case | 6 | EA | 1,000.00 | 6,000 |
| Glassware pegboards ( 1/RM) - allow | 6 | EA | 350.00 | 2,100 |
| Sgl sided fume hood #2210 | 1 | EA | 7,200.00 | 7,200 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Dbl sided fume hood #2214 | 1 | EA | 9,500.00 | 9,500 |
| First aid kit - allow | 6 | EA | 300.00 | 1,800 |
| OH track - equip support - allow | | NIC | | |
| Safety SHW | | w/ plumbing | | |
| Fire blanket | 6 | EA | 500.00 | 3,000 |
| Fire ext & cab ( 1/RM) | 6 | EA | 425.00 | 2,550 |
| Misc equipment | 6 | RM | 500.00 | 3,000 |
| Science Shared Prep Room Equipment ( 3 EA): | | | | |
| Refrigerator - full size | 3 | EA | 750.00 | 2,250 |
| Dishwasher under counter | 3 | EA | 1,100.00 | 3,300 |
| Glassware pegboards (1 RM) - allow | 1 | EA | 350.00 | 350 |
| Misc equipment | 3 | RM | 500.00 | 1,500 |
| Chem storage/fume unit | 3 | EA | 8,500.00 | 25,500 |
| *Includes Sections 115300 - 115313 | | | | |
| Allow: | | | | |
| Loading dock bumpers | 1 | LS | 3,500.00 | 3,500 |
| Kiln (11.38) | 1 | EA | 4,000.00 | 4,000 |
| Metal storage shelving | | NIC | | |
| Library equipment | | NIC | | |
| Power op changing table- Hoyer lift | | NIC | | |
| Vocational shop equipment(spec 115700) | 1 | LS | 25,000.00 | 25,000 |
| A420 Exhaust hood Tech Lab | W/Vocational allowance | | | |
| *Includes Section 115300, 115313 & 115700 | | | | |
| | | | | 100,550 |

DIVISION 12 - FURNISHINGS

122400 WINDOW SHADES

| | | | | |
|---|---|---|---|---|
| Exterior Manual op Window Shade | 8,000 | SF | 8.00 | 64,000 |
| Interior Roller Shade (4/A690): | | | | |
| Int borrowed light | 3,304 | SF | 6.50 | 21,476 |
| Door Manual Shade | | | | |
| Single Door | 50 | EA | 150.00 | 7,500 |
| A312 Int panel grilles (Rulon) | W / Finish Carpentry | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | 92,976 |
| 122414 MOTORIZED WINDOW SHADES | | | | |
| Motorized skylight shade (122414) | | NIC | | |
| | | | | 0 |
| 123553 CASEWORK | | | | |
| Utility & closet shelving | 1 | LS | 10,000.00 | 10,000 |
| Solid surface lav ctr | 243 | LF | 265.00 | 64,395 |
| Display Case ( 6/A401) | 18 | LF | 1,000.00 | 18,000 |
| Art recess corridor #2000 | 1 | LS | 15,000.00 | 15,000 |
| Classroom Entry: | | | | |
| Corridor built-in bench A621 4'w | 212 | LF | 400.00 | 84,800 |
| Framing and Blocking: | | | | |
| Corridor Locker Enclosure (nic mtl locker) - allow (7/A650): | | | | |
| Freestanding - 1st flr | 307 | LF | 320.00 | 98,240 |
| Freestanding - upper flr | 724 | LF | 320.00 | 231,680 |
| Main Office 2nd Floor: | | | | |
| P. lam Radial Reception counters | 20 | LF | 650.00 | 13,000 |
| Radial work island /work table | 38 | SF | 165.00 | 6,270 |
| Reception work ctr | 10 | LF | 325.00 | 3,250 |
| Tall storage unit 4' | 3 | EA | 1,650.00 | 4,950 |
| Mail unit wall cab | 16 | LF | 750.00 | 12,000 |
| Mail area work ctr | 16 | LF | 250.00 | 4,000 |
| Mobile storage cab (36"x27"h) | 4 | EA | 1,200.00 | 4,800 |
| Copier area work ctr | 16 | LF | 250.00 | 4,000 |
| Large conf base cab w/ctr | 15 | LF | 450.00 | 6,750 |
| Work space work ctr | 16 | LF | 250.00 | 4,000 |
| Library / Media Center (1 EA): | | | | |
| P. lam circulation desk - radial | 11 | LF | 1,200.00 | 13,200 |
| Book shelving sys - free standing | | NIC | | |
| 8'6" Book shelving sys-perm fixed unit | 39 | LF | 500.00 | 19,500 |
| P. lam work ctr | 27 | LF | 175.00 | 4,725 |
| Mobile storage cab (36"x27"h) | 6 | EA | 1,200.00 | 7,200 |
| 30" P. lam work ctr | 33 | LF | 220.00 | 7,260 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Science Lab Classroom ( 6 EA): | | | | |
| Sink | | | w/ plumbing | |
| 24" Epoxy ctr (no base cab (48.5LF/RM) | 291 | LF | 295.00 | 85,845 |
| 24"H Epoxy backsplash ( 48.5 LF/RM) | 582 | SF | 95.00 | 55,290 |
| Mobile storage cab (36"wx27"h 8/RM) | 48 | EA | 1,200.00 | 57,600 |
| P lam Wall cab (10 LF/RM) | 60 | LF | 210.00 | 12,600 |
| Teachers demo table | | NIC | | |
| Student table | | NIC | | |
| Science Shared Prep Room ( 3 EA): | | | | |
| Sink | | | w/ plumbing | |
| 24" Epoxy ctr (no base cab ) | 54 | LF | 295.00 | 15,930 |
| 24"H Epoxy backsplash | 109 | SF | 95.00 | 10,355 |
| P lam Wall cab | 30 | LF | 210.00 | 6,300 |
| Mobile storage cab (36"wx27"h) | 8 | EA | 1,200.00 | 9,600 |
| Tech-Makerspace ( 1 EA): | | | | |
| 30" P. lam counter w/backsplash(no base c | 10.5 | LF | 230.00 | 2,415 |
| Mobile storage cab (36"x27"h) | 1 | EA | 1,200.00 | 1,200 |
| 24" P. lam back splash | 21 | SF | 25.00 | 525 |
| 4 Tier shelving unit | 3 | LF | 400.00 | 1,200 |
| (6.81) Shadow relief | 2 | EA | 450.00 | 900 |
| Fab-lab ( 1 EA): | | | | |
| P.lam Counter | 13.5 | LF | 230.00 | 3,105 |
| Mobile storage cab (36"x27"h) | 1 | EA | 1,200.00 | 1,200 |
| 24" P. lam back splash | 27 | SF | 25.00 | 675 |
| 4 Tier shelving unit | 3 | LF | 400.00 | 1,200 |
| (6.81) Shadow relief 3D mdo | 2 | EA | 450.00 | 900 |
| Art Class Room (1 EA): | | | | |
| 3' Tall storage cab | 4 | EA | 1,550.00 | 6,200 |
| Epoxy ctr (no base cab) | 20.5 | LF | 295.00 | 6,048 |
| 24"H Epoxy backsplash | 41 | SF | 95.00 | 3,895 |
| Class Closet ( 34 EA): | | | | |
| 12" MDO lowest Shelf w/ framing (4'6"/LC | 153 | LF | 45.00 | 6,885 |
| 12" Shelving (4 tier- 18'/loc) | 612 | LF | 42.00 | 25,704 |
| Teacher Prep Room (24 EA): | | | | |
| P Lam ctr w/ wd edge ( 11'/loc) | | N/A | | |
| 12" MDO lowest Shelf w/ framing (9' LOC | 216 | LF | 45.00 | 9,720 |
| 12" Shelving (4 tier- 36'/loc) | 864 | LF | 42.00 | 36,288 |
| Typ, SPED & ELL Classroom (32 EA - A410): | | | | |
| 30" P Lam ctr w/ wd edge ( 12' 6"/loc) | 400 | LF | 275.00 | 110,000 |
| 30" P Lam flip top ctr w/ wd edge ( 3'/loc) | 96 | LF | 325.00 | 31,200 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Mobile storage cab (36"wx27"h 3/RM) | 96 | EA | 1,200.00 | 115,200 |
| 4 tier shelving unit (10' /loc) | 320 | LF | 400.00 | 128,000 |
| (6.81) Shadow relief 3D mdo (3/rm) | 96 | EA | 450.00 | 43,200 |
| Music Classroom ( 2 EA): | | | | |
| 30" P Lam ctr w/ wd edge | 26 | LF | 275.00 | 7,150 |
| Mobile storage cab (36"wx27"h 2/RM) | 4 | EA | 1,200.00 | 4,800 |
| Ext wall 4 tier shelving unit 8'6" - (1/loc) | 17 | LF | 400.00 | 6,800 |
| (6.81) Shadow relief 3D mdo (2/rm) | 4 | EA | 450.00 | 1,800 |
| Drama Classroom ( 1 EA): | | | | |
| 30" P Lam ctr w/ wd edge | 16 | LF | 275.00 | 4,400 |
| 24" P.lam backsplash | 32 | SF | 25.00 | 800 |
| Mobile storage cab (36"wx27"h) | 2 | EA | 1,200.00 | 2,400 |
| SPED Classroom #1260 ( Additional casework 1 EA): | | | | |
| Sink ctr w/skirt | 6 | LF | 300.00 | 1,800 |
| 24" P.lam backsplash | 17 | SF | 25.00 | 425 |
| SPED Classroom #2260 ( Additional casework 1 EA): | | | | |
| 42" Wall cab | 15 | LF | 225.00 | 3,375 |
| Sink ctr w/skirt | 15 | LF | 300.00 | 4,500 |
| 20" P.lam backsplash | 25 | SF | 25.00 | 625 |
| Staff Lunch Room ( 1 EA): | | | | |
| Base cab w/p.lam ctr | 7.5 | LF | 425.00 | 3,188 |
| Custodian Office (1 EA): | | | | |
| Work ctr | 9 | LF | 165.00 | 1,485 |
| Medical Suite (A425): | | | | |
| Work ctr | 15 | LF | 165.00 | 2,475 |
| Wall cab | 8 | LF | 200.00 | 1,600 |
| Open wall cab | 7 | LF | 225.00 | 1,575 |
| Microwave shelf | 3 | LF | 225.00 | 675 |
| Aud Dressing room (2 EA): | | | | |
| P.lam counter w/ backsplash(no base cab) | 38 | LF | 225.00 | 8,550 |
| Auditorium: | | | | |
| P.lam AV ctr | 9 | LF | 165.00 | 1,485 |
| P.lam projector support | 1 | LOC | 1,500.00 | 1,500 |
| P lam low wall @ seating complete | 89 | LF | 475.00 | 42,275 |
| Guidance Suite (3 Loc): | | | | |
| Base cab w/ctr | 8 | LF | 350.00 | 2,625 |
| Wall cab | 15 | LF | 210.00 | 3,150 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Misc. Casework Allowance: | | | | |
| Misc Display Cases (19/A621) | 1 | LS | 20,000.00 | 20,000 |
| Trash/ recycle ctr - allow | 1 | EA | 10,000.00 | 10,000 |
| Custom P lam radial bench - Corr #2000 | 38 | SF | 100.00 | 3,800 |
| Kit. serving ctr (4/603) | 32 | LF | 265.00 | 8,480 |
| *Counter tops include manufactures wall brackets | | | | |
| *Includes Section 123653 | | | | |
| | | | | 1,577,937 |
| 124813 FLOOR MATS | | | | |
| Floor Finishes: | | | | |
| Recessed mtl vest. grille (2 loc) | 360 | SF | 22.00 | 7,920 |
| | | | | 7,920 |
| 124816 ENTRANCE GRILLES & FRAMES | | w/124813 | | |
| | | | | 0 |
| 126613 TELESCOPING BLEACHERS | | w/116000 | | |
| | | | | 0 |
| 129000 MISCELLANEOUS FURNISHING | | | | |
| Auditorium fixed seat | 321 | EA | 295.00 | 94,695 |
| Removable auditorium seat | 46 | EA | 125.00 | 5,750 |
| Stackable auditorium seat | 48 | EA | 125.00 | 6,000 |
| *Includes Section 126100 | | | | |
| Choral classroom risers | | W/FFE | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Band classroom risers | | W/FFE | | |
| Stage risers | | W/FFE | | |
| *Includes Section 126100 | | | | |
| | | | | 106,445 |
| DIVISION 13 - SPECIAL CONSTRUCTION | | | | |
| 130000 SPECIAL CONSTRUCTION | | N/A | | |
| | | | | 0 |
| DIVISION 14 - CONVEYING EQUIPMENT | | | | |
| 140001 ELEVATORS* | | | | |
| Passenger elevator ( 1 door - 4,500 lb) *Includes roof level stop | 4 | STOP | 53,000.00 | 212,000 |
| | | | | 212,000 |
| DIVISION 21 - FIRE SUPPRESSION | | | | |
| 210001 FIRE SUPPRESSION* | | | | |
| 6" BF Preventer | 1 | EA | 7,450.00 | 7,450 |
| Wet valve assembly | 1 | LS | 3,500.00 | 3,500 |
| Elec. bell | 1 | LS | 1,500.00 | 1,500 |
| Siamese fire dept connection | 1 | LS | 1,350.00 | 1,350 |
| Fire Dept. Connection: | | | | |
| 2 1/2" w/cabinet | 9 | EA | 1,850.00 | 16,650 |
| Siamese FD Connection | 2 | EA | 1,235.00 | 2,470 |
| FCVA - 4" | 9 | EA | 1,050.00 | 9,450 |
| Tamper sw | 30 | EA | 225.00 | 6,750 |
| Heads and Branch: | | | | |
| Semi Recess head - typ. | 946 | EA | 315.00 | 297,990 |
| Concealed head - aud. | 41 | EA | 750.00 | 30,750 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Upright head | 315 | EA | 329.00 | 103,635 |
| Upright w/ cage | 71 | EA | 360.00 | 25,560 |
| Sidewall | 144 | EA | 285.00 | 41,040 |
| Window wash | 12 | EA | 385.00 | 4,620 |
| 3" drain | 220 | LF | 31.50 | 6,930 |
| 2 1/2" - 6" | 5,100 | LF | 39.00 | 198,900 |
| 4" Shut off | 4 | EA | 1,025.00 | 4,100 |
| 6" Shut off | 4 | EA | 1,185.00 | 4,740 |
| Misc. Valve | 1 | LS | 10,000.00 | 10,000 |
| Underground Fire Prot. Service: | | | | |
| 6" | 10 | LF | 110.00 | 1,100 |
| Coring and firesafing | 1 | LS | 5,000.00 | 5,000 |
| Staging and Lifts | 1 | LS | 30,000.00 | 30,000 |
| Test, as built | 1 | LS | 40,000.00 | 40,000 |
| | | | | 853,485 |

DIVISION 22 - PLUMBING

220001 PLUMBING*

| | | | | |
|---|---|---|---|---|
| Plumbing Fixtures ( Per Plumbing): | | | | |
| P-1 water closet | 20 | EA | 1,850.00 | 37,000 |
| P-1A water closet | 31 | EA | 1,850.00 | 57,350 |
| P-2 Urinal | 18 | EA | 1,575.00 | 28,350 |
| P-2A Urinal | 8 | EA | 1,575.00 | 12,600 |
| P-3 Lav ctr mtd | 47 | EA | 1,100.00 | 51,700 |
| P-3A Lav wall hung | 31 | EA | 1,375.00 | 42,625 |
| P-4 Drinking Fountain (high/low) | 11 | EA | 3,150.00 | 34,650 |
| P-5 Mop Receptor | 5 | EA | 1,425.00 | 7,125 |
| P-6 Shower 3x3 | 1 | EA | 2,850.00 | 2,850 |
| P-6 Shower 5x3 | 2 | EA | 3,000.00 | 6,000 |
| P-7 Science | 40 | EA | 2,200.00 | 88,000 |
| P-7A | 2 | EA | 2,200.00 | 4,400 |
| P - 8 | 4 | EA | 1,500.00 | 6,000 |
| P - 9 Art Sink w/ Plaster Trap | 4 | EA | 2,150.00 | 8,600 |
| P - 10 Eye Wash Station | 5 | EA | 2,800.00 | 14,000 |
| Sink - Aud. dressing rm | 4 | EA | 1,500.00 | 6,000 |
| Sink - health office | 1 | EA | 1,500.00 | 1,500 |
| Sink - SPED | 1 | EA | 1,500.00 | 1,500 |
| Sink - Tech Lab | 2 | EA | 1,500.00 | 3,000 |
| Sensor Faucet ( spec only) | 78 | EA | 525.00 | 40,950 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Sensor Flush ( spec ‹ not indicated | 77 | EA | 485.00 | 37,345 |
| FPSC wall hydrant | 8 | EA | 450.00 | 3,600 |
| HB hose bibb | 18 | EA | 350.00 | 6,300 |
| IMB Conn | 5 | EA | 500.00 | 2,500 |
| Fix Connection | 237 | EA | 300.00 | 71,100 |
| Misc. Specialties: | | | | |
| MV-1 | 1 | EA | 7,500.00 | 7,500 |
| MV-2 - science room | 5 | EA | 1,250.00 | 6,250 |
| 1" Mech BFP | 3 | EA | 950.00 | 2,850 |
| Misc. Mix valve | 4 | EA | 450.00 | 1,800 |
| P - 11 Fume Hood Connection | 3 | EA | 2,500.00 | 7,500 |
| Heat Trace non potable water ( spec ) | 1 | LS | 5,000.00 | 5,000 |
| Fire sealing penetration | 1 | LS | 45,000.00 | 45,000 |
| Elevator Sump pump | 1 | EA | 3,500.00 | 3,500 |
| Pumps: | | | | |
| RP-1 & RP-2 | 2 | EA | 15,000.00 | 30,000 |
| RP-3 | 1 | EA | 4,500.00 | 4,500 |
| RP-4 | 1 | EA | 4,500.00 | 4,500 |
| Gas Fire Hot Water Supply Boiler: | | | | |
| BLR-1, 2(Lochinvar - Armor AWN501P ) | 2 | LS | 19,500.00 | 39,000 |
| HW Storage Tank | 1 | EA | 18,000.00 | 18,000 |
| Mech Rm Neutralization | 1 | EA | 4,000.00 | 4,000 |
| Boiler Valve and Trim | 1 | LS | 30,000.00 | 30,000 |
| Heat Trace | 1 | LS | 7,500.00 | 7,500 |
| Interior Grease Interceptor: | | | | |
| GI-1 & GI-2 | 2 | EA | 8,500.00 | 17,000 |
| Roof/Storm Drain System | | | | |
| Underground D/W/V Pipe: | | | | |
| 4" | 61 | LF | 46.00 | 2,806 |
| 6" | 75 | LF | 61.00 | 4,575 |
| 8" | 75 | LF | 96.00 | 7,200 |
| 10" | 93 | LF | 110.00 | 10,230 |
| 12" | 19 | LF | 132.00 | 2,508 |
| FCO | 8 | LF | 425.00 | 3,400 |
| Above Ground D/W/V Pipe: | | | | |
| 4" | 230 | LF | 48.00 | 11,040 |
| 6" | 932 | LF | 63.00 | 58,716 |
| 8" | 486 | LF | 99.50 | 48,357 |
| 10" | 150 | LF | 112.00 | 16,800 |
| CO | 20 | EA | 400.00 | 8,000 |
| RD - 4" | 7 | EA | 1,275.00 | 8,925 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| RD - 5" | 3 | EA | 1,320.00 | 3,960 |
| RD - 6" | 9 | EA | 1,460.00 | 13,140 |
| RD - 8" | 2 | EA | 1,545.00 | 3,090 |
| Insulate leader | 1,000 | LF | 13.00 | 13,000 |
| Footing drain | 100 | LF | 36.50 | 3,650 |
| Acid Waster System: | | | | |
| Underground D/W/V Pipe: | | | | |
| 2" | 43 | LF | 41.00 | 1,763 |
| 4" | 587 | LF | 62.00 | 36,394 |
| FCO | 6 | EA | 485.00 | 2,910 |
| FD | 5 | EA | 725.00 | 3,625 |
| Above Ground Sanitary D/W/V Pipe: | | | | |
| 4" | 447 | LF | 67.00 | 29,949 |
| Acid Neutralization Precast Structure | 1 | EA | 15,000.00 | 15,000 |
| Neutralization Tank and Alarm | 1 | EA | 35,000.00 | 35,000 |
| Precast Pump Chamber | 1 | EA | 25,000.00 | 25,000 |
| Domestic Piping: | | | | |
| 1 1/2" | 339 | LF | 33.90 | 11,492 |
| 1 1/4" | 754 | LF | 27.80 | 20,961 |
| 1" | 2,900 | LF | 23.65 | 68,585 |
| 1/2" | 1,245 | LF | 18.10 | 22,535 |
| 2 1/2" | 533 | LF | 66.00 | 35,178 |
| 2" | 735 | LF | 48.20 | 35,427 |
| 3" | 50 | LF | 89.00 | 4,450 |
| 3/4" | 1,590 | LF | 20.60 | 32,754 |
| 6" | 100 | LF | 162.00 | 16,200 |
| Kitchen conn | 1 | LS | 30,000.00 | 30,000 |
| Water Hammer arrestors | 1 | LS | 5,000.00 | 5,000 |
| 1" Pipe Insulation: | | | | |
| 1 1/2" | 339 | LF | 8.00 | 2,712 |
| 1 1/4" | 754 | LF | 7.90 | 5,957 |
| 1" | 2,900 | LF | 7.50 | 21,750 |
| 1/2" | 1,245 | LF | 7.10 | 8,840 |
| 2 1/2" | 533 | LF | 9.00 | 4,797 |
| 2" | 735 | LF | 8.45 | 6,211 |
| 3" | 50 | LF | 9.50 | 475 |
| 3/4" | 1,590 | LF | 7.40 | 11,766 |
| 6" | 100 | LF | 14.45 | 1,445 |
| Sanitary System | | | | |
| Underground D/W/V Pipe: | | | | |
| 2" | 79 | LF | 32.00 | 2,528 |
| 3" | 392 | LF | 38.00 | 14,896 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 4" | 971 | LF | 49.00 | 47,579 |
| 5" | 284 | LF | 56.00 | 15,904 |
| 6" | 14 | LF | 63.00 | 882 |
| 8" | 31 | LF | 99.50 | 3,085 |
| Floor Drain | 17 | EA | 580.00 | 9,860 |
| Gas and Sand separator | 1 | EA | 15,000.00 | 15,000 |
| 5,000 gal. Grease Trap | 1 | EA | 22,000.00 | 22,000 |
| Sewer manhole | 1 | EA | 4,000.00 | 4,000 |
| Floor Sink | 8 | EA | 2,200.00 | 17,600 |
| FCO | 25 | EA | 425.00 | 10,625 |
| Above Ground D/W/V Pipe: | | | | |
| 2" | 1,600 | LF | 32.00 | 51,200 |
| 3" | 600 | LF | 38.00 | 22,800 |
| 4" | 1,249 | LF | 49.00 | 61,201 |
| FD | 18 | EA | 800.00 | 14,400 |
| CO | 20 | EA | 495.00 | 9,900 |
| Trap primer Pipe | 1 | LS | 5,000.00 | 5,000 |
| Roof Vent Term. | 8 | EA | 1,100.00 | 8,800 |
| Gas Pipe: | | | | |
| 1" - Science hw conn? | 300 | LF | 36.00 | 10,800 |
| 2" - main | 135 | LF | 75.00 | 10,125 |
| 3/4" - kitchen | 50 | LF | 30.00 | 1,500 |
| 1" - 1/2' lab connection | 1 | RM | 30,000.00 | 30,000 |
| Kitchen Connection | 1 | LS | 5,000.00 | 5,000 |
| Boiler Room Connections | 1 | LS | 5,000.00 | 5,000 |
| Kitchen Master Shut off | 1 | LS | 4,000.00 | 4,000 |
| Gas sub metering | 3 | EA | 3,000.00 | 9,000 |
| Flues: | | | | |
| 6" HW Flue | 60 | LF | 95.00 | 5,700 |
| Generator: | | | | |
| Gas Connection | 1 | LS | 25,000.00 | 25,000 |
| Exhaust Breeching | | NIC | | |
| Underground Water Service: | | | | |
| 6" | 10 | LF | 150.00 | 1,500 |
| Meter Install Only | 1 | EA | 2,500.00 | 2,500 |
| Sub-meter | 3 | EA | 3,000.00 | 9,000 |
| 6" BFP | 1 | EA | 12,500.00 | 12,500 |
| Staging and Lifts | 1 | LS | 30,000.00 | 30,000 |
| Commissioning Coordination | 200 | HRS | 125.00 | 25,000 |
| Sanitize system | 1 | LS | 25,000.00 | 25,000 |
| Test , permit misc gc | 1 | LS | 75,000.00 | 75,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | --- |
| | | | | 2,148,401 |
| DIVISION 23 - HVAC | | | | |
| 230001 HVAC* | | | | |
| Rooftop Units: | | | | |
| RTU-1 (22,000 cfm) | 20,000 | CFM | 15.00 | 300,000 |
| RTU-2 (22,000 cfm) | 20,000 | CFM | 15.00 | 300,000 |
| RTU-3 (22,000 cfm) | 20,000 | CFM | 15.00 | 300,000 |
| RTU-4 (22,000 cfm) | 20,000 | CFM | 15.00 | 300,000 |
| RTU-5 (15,000 cfm) | 15,000 | CFM | 15.00 | 225,000 |
| RTU-6 (12,000 cfm) | 12,000 | CFM | 15.00 | 180,000 |
| RTU-7 (2,000 cfm) | 2,000 | CFM | 13.50 | 27,000 |
| Make Up Air Units: | | | | |
| MAU-1 (5,000 cfm) | 4,170 | CFM | 12.00 | 50,040 |
| Sound Attenuators ( 17 ea ) | 218,000 | CFM | 0.55 | 119,900 |
| Exhaust Fans: | | | | |
| EF-1 G-VG - roof | 1 | EA | 3,150.00 | 3,150 |
| EF-2 G-VG - roof | 1 | EA | 3,150.00 | 3,150 |
| EF-3 G-VG - roof | 1 | EA | 3,150.00 | 3,150 |
| EF-4 G-VG - roof | 1 | EA | 3,150.00 | 3,150 |
| EF-5 SQ-VG - kiln | 1 | EA | 2,850.00 | 2,850 |
| SEF-1 QEI - roof | 1 | EA | 22,000.00 | 22,000 |
| SEF-2 QEI - roof | 1 | EA | 22,000.00 | 22,000 |
| SEF-3 QEI - roof | 1 | EA | 22,000.00 | 22,000 |
| SEF-4 QEI - roof | 1 | EA | 22,000.00 | 22,000 |
| KEF-1 Cube - roof | 1 | EA | 5,500.00 | 5,500 |
| KEF-2 Cube - roof | 1 | EA | 5,500.00 | 5,500 |
| FEF-1 Vektor - roof | 1 | EA | 12,250.00 | 12,250 |
| FEF-2 Vektor - roof | 1 | EA | 12,250.00 | 12,250 |
| FEF-3 Vektor - roof | 1 | EA | 12,250.00 | 12,250 |
| FEF-4 Vektor - roof | 1 | EA | 12,250.00 | 12,250 |
| FEF-5 Vektor - roof | 1 | EA | 12,250.00 | 12,250 |
| Dust Collection: | | | | |
| DC-1 | 1 | EA | 35,000.00 | 35,000 |
| Dust Connection: | | | | |
| Bandsaw | 1 | EA | 2,500.00 | 2,500 |
| Combo sander | 1 | EA | 2,500.00 | 2,500 |
| Planer | 1 | EA | 2,500.00 | 2,500 |
| Table swa | 1 | EA | 2,500.00 | 2,500 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Jointer | 1 | EA | 2,500.00 | 2,500 |
| Miter saw | 1 | EA | 2,500.00 | 2,500 |
| | | | | |
| HW System: | | | | |
| HWB-1 (AR 4,000) | 1 | EA | 52,500.00 | 52,500 |
| HWB-2 (AR 4,000) | 1 | EA | 52,500.00 | 52,500 |
| HWP-1,2 | 2 | EA | 15,000.00 | 30,000 |
| BP 1,2 | 2 | EA | 2,250.00 | 4,500 |
| VFD | 2 | EA | 3,200.00 | 6,400 |
| Chemical feed | 1 | LS | 35,000.00 | 35,000 |
| Air separator | 1 | EA | 2,800.00 | 2,800 |
| Expansion tank | 1 | EA | 3,200.00 | 3,200 |
| 8" Feed Manifold | 50 | LF | 350.00 | 17,500 |
| 6" Manifold S&R | 100 | LF | 225.00 | 22,500 |
| Boiler piping trim and valves | 1 | LS | 26,000.00 | 26,000 |
| 10" Flue | 365 | LF | 185.00 | 67,525 |
| Flue Roof Term and Mast | 4 | EA | 1,500.00 | 6,000 |
| PH Tank | 1 | LS | 1,500.00 | 1,500 |
| Intake Louver and Damper | 1 | LS | 6,000.00 | 6,000 |
| Exhaust Louver and Damper | 1 | LS | 6,000.00 | 6,000 |
| 10" Boiler flue | 275 | LF | 160.00 | 44,000 |
| Elec Room Exhaust fan and Louver | 1 | LS | 3,500.00 | 3,500 |
| | | | | |
| Air-Cooled Chiller: | | | | |
| CH - 1 | 370 | TON | 1,050.00 | 388,500 |
| Chiller rough in, valve and trim | 1 | LS | 20,000.00 | 20,000 |
| Pump Package | 1 | LS | 175,000.00 | 175,000 |
| | | | | |
| Ductwork: | | | | |
| Galv Ductwork | 136,090 | LBS | 10.50 | 1,428,945 |
| Stainless Steel - welded | 4,000 | LBS | 25.00 | 100,000 |
| | | | | |
| Premium for perf atruium ducts | 1 | LS | 25,000.00 | 25,000 |
| 20" Fabric duct soc | 402 | LF | 36.50 | 14,673 |
| 24" Fabric duct soc | 302 | LF | 41.00 | 12,382 |
| Kitchen hood exhaust duct - welded | 2,918 | LBS | 17.50 | 51,065 |
| Alum. dishwasher ductwork | 750 | LBS | 12.00 | 9,000 |
| | | | | |
| 1" Duct insul | 48,376 | SF | 4.10 | 198,342 |
| Duct Liner | 8,025 | SF | 6.25 | 50,156 |
| Matt white Rigid duct insul; | 20,000 | SF | 6.80 | 136,000 |
| EPDM wrap | 9,055 | SF | 12.00 | 108,660 |
| 2 HR Fire wrap - dbl wrap | 849 | SF | 16.20 | 13,754 |
| | | | | |
| Plenum Air Intake | | | | |
| Alum Louver | carried w/ exterior | | | |
| Motor Op damper | 19 | EA | 4,500.00 | 85,500 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Ducted Plenum intake | 19 | EA | 3,000.00 | 57,000 |
| Air Devices: | | | | |
| DD - 1 | 39 | EA | 450.00 | 17,550 |
| DD - 2 | 116 | EA | 575.00 | 66,700 |
| DD - 3 | 22 | EA | 375.00 | 8,250 |
| DD - 4 | 7 | EA | 310.00 | 2,170 |
| DD - 5 | 5 | EA | 875.00 | 4,375 |
| DD - 6 | 4 | EA | 600.00 | 2,400 |
| DD - 7 | 40 | EA | 775.00 | 31,000 |
| DD - 8 | 3 | EA | 825.00 | 2,475 |
| DD - 9 | 4 | EA | 975.00 | 3,900 |
| E - 1 | 57 | EA | 195.00 | 11,115 |
| R - 1 | 86 | EA | 185.00 | 15,910 |
| R - 2 | 7 | EA | 195.00 | 1,365 |
| SA - 1 | 14 | EA | 220.00 | 3,080 |
| VAV Box | 150 | EA | 1,250.00 | 187,500 |
| CV Regulator | 32 | EA | 980.00 | 31,360 |
| Volume Damper | 47 | EA | 245.00 | 11,515 |
| Auto Damper | 16 | EA | 1,400.00 | 22,400 |
| Fire damper | 30 | EA | 550.00 | 16,500 |
| Destratification fan | 3 | EA | 8,500.00 | 25,500 |
| AC Split System: | | | | |
| Ductless Cooling Unit Systems: | | | | |
| DCUe-1 | 1 | EA | 7,800.00 | 7,800 |
| DCUe-2 | 1 | EA | 10,500.00 | 10,500 |
| DCUe-3 | 1 | EA | 10,500.00 | 10,500 |
| DCUe-4 | 1 | EA | 9,500.00 | 9,500 |
| DCUe-5 | 1 | EA | 9,500.00 | 9,500 |
| DCUe-6 | 1 | EA | 9,500.00 | 9,500 |
| DCUe-7 | 1 | EA | 9,500.00 | 9,500 |
| DCUe-8 | 1 | EA | 9,500.00 | 9,500 |
| Condensate Pumps: | | | | |
| CP-1 & Cond. Piping | 8 | EA | 1,200.00 | 9,600 |
| Hydraunic Heater: | | | | |
| Unit Heater | 16 | EA | 1,100.00 | 17,600 |
| RP - 1 | 1,341 | LF | 156.00 | 209,196 |
| RP - 2 | 92 | LF | 156.00 | 14,352 |
| FTR - 1 | 602 | LF | 68.00 | 40,936 |
| FTR - 2 | 320 | LF | 68.00 | 21,760 |
| FT Cover | 934 | LF | 27.00 | 25,218 |
| Modulating Valve | 135 | EA | 285.00 | 38,475 |
| Isolation valve | 270 | EA | 92.00 | 24,840 |
| Electric Fin Tube Heater | 8 | EA | 950.00 | 7,600 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Domestic Piping: | | | | |
| 1 1/2" | 1,031 | LF | 33.25 | 34,281 |
| 1 1/4" | 897 | LF | 27.30 | 24,488 |
| 1" | 2,139 | LF | 22.00 | 47,058 |
| 2 1/2" | 723 | LF | 66.00 | 47,718 |
| 2" | 1,516 | LF | 44.00 | 66,704 |
| 3" | 504 | LF | 91.00 | 45,864 |
| 3/4" | 7,788 | LF | 19.50 | 151,866 |
| 4" | 967 | LF | 103.00 | 99,601 |
| 6" | 1,374 | LF | 144.50 | 198,543 |
| 8" | 243 | LF | 187.00 | 45,441 |
| 1" Pipe Insulation: | | | | |
| 1 1/2" | 1,031 | LF | 8.00 | 8,248 |
| 1 1/4" | 897 | LF | 7.90 | 7,086 |
| 1" | 2,139 | LF | 7.50 | 16,043 |
| 2 1/2" | 723 | LF | 9.00 | 6,507 |
| 2" | 1,516 | LF | 8.45 | 12,810 |
| 3" | 504 | LF | 9.50 | 4,788 |
| 3/4" | 7,788 | LF | 7.40 | 57,631 |
| 4" | 967 | LF | 11.90 | 11,507 |
| 6" | 1,374 | LF | 14.45 | 19,854 |
| 8" | 243 | LF | 16.25 | 3,949 |
| Mechanical Piping: | | | | |
| AHU Valving | 8 | EA | 3,500.00 | 28,000 |
| Misc. Control Valve | 8 | EA | 2,500.00 | 20,000 |
| Temperature Control: | | | | |
| AHU/ERV | 8 | EA | 25,000.00 | 200,000 |
| Chiller and Cooling Equipment | 1 | LS | 30,000.00 | 30,000 |
| Boiler and Heating | 1 | LS | 20,000.00 | 20,000 |
| Pump | 6 | EA | 1,800.00 | 10,800 |
| VAV | 156 | EA | 1,500.00 | 234,000 |
| Hydronic point | 135 | EA | 1,000.00 | 135,000 |
| Exhaust Fan | 17 | EA | 1,500.00 | 25,500 |
| AC Split | 8 | EA | 750.00 | 6,000 |
| CO2 Sensor | 119 | EA | 650.00 | 77,350 |
| T stat | 188 | EA | 485.00 | 91,180 |
| Misc. temp control | 1 | LS | 50,000.00 | 50,000 |
| Seismic & vibrator control | 1 | LS | 35,000.00 | 35,000 |
| Test and balance | 136,600 | GSF | 0.65 | 88,790 |
| Staging and Lifts | 1 | LS | 30,000.00 | 30,000 |
| Commission coordination | 1 | LS | 25,000.00 | 25,000 |
| GC & misc. | 1 | LS | 25,000.00 | 25,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | --- |
| | | | | 8,281,591 |
| DIVISION 26 - ELECTRICAL | | | | |
| 260001 ELECTRICAL* | | | | |
| Lighting Fixtures: | | | | |
| Exit | 43 | EA | 324.20 | 13,941 |
| G$ - gym | 80 | EA | 837.00 | 66,960 |
| LC3 - classroom cove | 1,927 | LF | 97.76 | 188,384 |
| LK24 | 15 | EA | 267.00 | 4,005 |
| LP4 | 6 | EA | 452.00 | 2,712 |
| LP4S - aud | 81 | EA | 775.00 | 62,775 |
| LP8 | 6 | EA | 836.40 | 5,018 |
| LR2 - typical | 763 | EA | 402.00 | 306,726 |
| LRD 5 - bathroom | 12 | EA | 1,119.00 | 13,428 |
| LRS - corridor | 104 | EA | 783.60 | 81,494 |
| LS2 | 2 | EA | 332.00 | 664 |
| LS4 | 53 | EA | 362.00 | 19,186 |
| LS8 | 17 | EA | 526.40 | 8,949 |
| LWS - bathroom cove | 647 | LF | 84.10 | 54,413 |
| RC-1 | 92 | EA | 267.00 | 24,564 |
| RSH | 1 | EA | 282.00 | 282 |
| SC - commons | 40 | EA | 888.00 | 35,520 |
| SL4 - exterior | 19 | EA | 507.80 | 9,648 |
| UC (as shown only ) | 66 | LF | 50.40 | 3,326 |
| Branch Wiring | 136,000 | SF | 1.25 | 170,000 |
| Lighting Control System | 136,000 | SF | 2.00 | 272,000 |
| Mechanical: | | | | |
| VAV 20A 1 frac | 89 | EA | 182.20 | 16,216 |
| WH 20A 1 1a | 3 | EA | 182.20 | 547 |
| WH 30A-3P-250v | 1 | EA | 344.00 | 344 |
| GB 30A-3P-250v | 2 | EA | 611.00 | 1,222 |
| J$M | 3 | EA | 182.20 | 547 |
| Meters & flows & solen $M WP | 14 | EA | 182.20 | 2,551 |
| MC-14/2 W/G | 1,500 | LF | 1.69 | 2,529 |
| MC-12/2 W/G | 1,900 | LF | 1.71 | 3,241 |
| MC-12/3 W/G | 1,400 | LF | 2.14 | 2,996 |
| MC-12/4 W/G | 1,180 | LF | 2.56 | 3,026 |
| MC-10/4 W/G | 400 | LF | 4.56 | 1,825 |
| UH | 21 | EA | 182.20 | 3,826 |
| EMT 3/4"C-3#12 | 2,800 | LF | 5.34 | 14,952 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| VFD FBO I&W | 17 | EA | 216.00 | 3,672 |
| 25 - 100/100A/3/480v | 4 | EA | 466.00 | 1,864 |
| EMT-1 1/2"C-4#2 & 1#8 | 500 | LF | 15.76 | 7,880 |
| GFI WP roof | 22 | EA | 97.00 | 2,134 |
| Roof stonco | 10 | EA | 228.00 | 2,280 |
| WP roof Switch | 10 | EA | 87.00 | 870 |
| EMT-3/"C-3#12 (roof) | 3,450 | LF | 5.32 | 18,354 |
| EMT-3/"C-4#12 (roof) | 3,100 | LF | 5.80 | 17,980 |
| CP-1 | 11 | EA | 182.20 | 2,004 |
| MC-12/2 W/G | 700 | LF | 1.71 | 1,194 |
| JB 8x8x4 | 11 | EA | 68.20 | 750 |
| 480v 3 30A | 11 | EA | 706.00 | 7,766 |
| 480v 3 40A | 2 | EA | 938.00 | 1,876 |
| EUH 250v 1 30A/2P | 3 | EA | 416.00 | 1,248 |
| ECU 208v 1 15A | 11 | EA | 182.20 | 2,004 |
| DCU J 208v 1 30A | 11 | EA | 436.00 | 4,796 |
| EMT-3/4"C-4#10 | 1,200 | LF | 6.38 | 7,656 |
| ET 120v 1 | 8 | EA | 182.20 | 1,458 |
| MAU-1 60/40A/3/480v | 1 | EA | 391.00 | 391 |
| EMT-1"C - 4#8 & 1#10 | 70 | LF | 7.14 | 500 |
| Mechanical (cont): | | | | |
| Boiler 20A - 1 30A/2P | 3 | EA | 513.00 | 1,539 |
| Boiler pumps 20A 2P 208v | 3 | EA | 366.00 | 1,098 |
| Chiller 480v 600/600A/3 | 2 | EA | 2,148.00 | 4,296 |
| EMT-3"C - 3#250 mcm & 1#4 | 260 | LF | 32.56 | 8,466 |
| EMT-3/4"C 4$8 & 1#10 | 140 | LF | 8.39 | 1,175 |
| SEF 100/100A/3/480v | 4 | EA | 650.00 | 2,600 |
| #2 MI cable | 1,600 | LF | 19.32 | 30,912 |
| #2 MI terms (quick) | 32 | EA | 116.00 | 3,712 |
| RTU - 400/250A/3/3R | 4 | EA | 971.00 | 3,884 |
| RTU - 200/150A/3/3R | 2 | EA | 613.00 | 1,226 |
| RTU - 100/70A/3/3R | 1 | EA | 486.00 | 486 |
| RTU - 60/50A/3/3R | 1 | EA | 391.00 | 391 |
| EMT-3"C-4#250 & 1#4 | 520 | LF | 40.38 | 20,998 |
| EMT-2"C-4#1/0 & 1#6 | 325 | LF | 21.96 | 7,137 |
| EMT-1 1/4"C-4#4 & 1#8 | 150 | LF | 12.62 | 1,893 |
| EMT-1"C-4#6 & 10 | 150 | LF | 10.25 | 1,538 |
| Wiring Devices & Scoreboard Work: | | | | |
| Duplex | 388 | EA | 58.84 | 22,830 |
| GFI duplex | 109 | EA | 61.84 | 6,741 |
| WP GFI | 8 | EA | 94.00 | 752 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Surf double duplex | 37 | EA | 124.00 | 4,588 |
| Switched rec w/IO module | 24 | EA | 240.00 | 5,760 |
| NEMA L14-20R | 27 | EA | 107.00 | 2,889 |
| LS limit switch | 3 | EA | 107.00 | 321 |
| CP cont pnl - wire only | 8 | EA | 144.00 | 1,152 |
| TML mtr conn | 8 | EA | 83.80 | 670 |
| J 4" sq w/cover | 6 | EA | 41.00 | 246 |
| ISO grd out shot clock | 2 | EA | 87.00 | 174 |
| Wire only scoreboard | 1 | EA | 144.00 | 144 |
| 30/20A/3240v | 2 | EA | 269.00 | 538 |
| EMT-3/4"C-4#12 | 1,800 | LF | 5.79 | 10,422 |
| Double duplex - color | 216 | EA | 101.40 | 21,902 |
| Tw loc @ tray | 11 | EA | 102.00 | 1,122 |
| Cable tray 24"c12'0" | 6 | EA | 309.00 | 1,854 |
| Poke thru | 2 | EA | 666.00 | 1,332 |
| Key sw | 1 | EA | 64.00 | 64 |
| MOM conn cw | 6 | EA | 70.00 | 420 |
| CP bleacher pwr | 7 | EA | 366.00 | 2,562 |
| MC-12/2 w/G | 39,500 | LF | 1.71 | 67,387 |
| MC-12/3 w/G | 2,000 | LF | 2.14 | 4,280 |
| EMT-3/4"C - 3#12 | 1,900 | LF | 5.32 | 10,108 |
| | | | | |
| Emergency Generator & ATS: | | | | |
| 300kw 277/480v Natural Gas Generator | 1 | EA | 159,320.00 | 159,320 |
| Enclosure | 1 | EA | 432.00 | 432 |
| 400A/3P output c/b | 1 | EA | 144.00 | 144 |
| 150A/3P output c/b | 1 | EA | 144.00 | 144 |
| Interior panel | 1 | EA | 288.00 | 288 |
| Receive rig & set | 1 | EA | 11,152.00 | 11,152 |
| Unit mtd EPO | 1 | EA | 638.00 | 638 |
| Bldg mtd EPO | 1 | EA | 907.00 | 907 |
| Annunciator | 1 | EA | 576.00 | 576 |
| ATS-OS 400A 4P | 1 | EA | 432.00 | 432 |
| ATS-LS 150A 4P | 1 | EA | 576.00 | 576 |
| PVC-1"C-4#10 & 1#10 | 150 | LF | 4.01 | 602 |
| PVC-1"C-14#13 | 150 | LF | 5.60 | 840 |
| EMT-3/4"C-2#14 | 280 | LF | 5.12 | 1,434 |
| EMT-3/4"C-5#14 | 120 | LF | 6.09 | 731 |
| MI - 4#1/0 | 140 | LF | 107.36 | 15,030 |
| MI - quick terms | 8 | LF | 133.20 | 1,066 |
| WIC 4#500 & 1#3 | 130 | LF | 45.84 | 5,959 |
| EMT-4"C-4#500 & 1#3 | 140 | LF | 67.24 | 9,414 |
| EMT-2"C-4#10 & 1#6 | 150 | LF | 21.96 | 3,294 |
| | | | | |
| Fire Alarm System: | | | | |
| Material | 1 | LS | 219,942.00 | 219,942 |
| Bi-directional antenna sys | 1 | LS | 4,752.00 | 4,752 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Elevator shaft & machine rm fitout | 1 | LS | 3,456.00 | 3,456 |
| Floor plan under glass | 3 | LS | 144.00 | 432 |
| Sprinkler bell I&W only | 1 | LS | 216.00 | 216 |
| DK drill key switch | 1 | LS | 72.00 | 72 |
| FACP flush control pnl | 1 | LS | 4,608.00 | 4,608 |
| Red beacon | 1 | LS | 216.00 | 216 |
| As built cabinet | 1 | LS | 144.00 | 144 |
| FM flush master box | 1 | LS | 360.00 | 360 |
| K knox box | 1 | LS | 216.00 | 216 |
| W white strobe | 1 | LS | 144.00 | 144 |
| LOC local operator control pnl | 1 | LS | 864.00 | 864 |
| Smoke exhaust graphic plaque w/LED indicator of statue | 1 | EA | 1,152.00 | 1,152 |
| FATC term cabinet | 3 | EA | 864.00 | 2,592 |
| ANN annunciator | 3 | EA | 432.00 | 1,296 |
| VE voice evac pnl | 1 | EA | 2,304.00 | 2,304 |
| MNS ?? | 3 | EA | 288.00 | 864 |
| LS limit sw | 6 | EA | 72.00 | 432 |
| BD beam det xmit/rcur | 5 | EA | 180.00 | 900 |
| MM monitor module | 66 | EA | 72.00 | 4,752 |
| CM control module | 26 | EA | 72.00 | 1,872 |
| IM isolation module | 3 | EA | 72.00 | 216 |
| CO2 det tie in | 1 | EA | 144.00 | 144 |
| Security tie in | 2 | EA | 144.00 | 288 |
| Refuge tie in | 1 | EA | 144.00 | 144 |
| BDA tie in | 5 | EA | 144.00 | 720 |
| CO MM CO2 det w/monitor mod | 9 | EA | 144.00 | 1,296 |
| Smoke w/base | 89 | EA | 72.00 | 6,408 |
| Smoke to control atrium smoke | 115 | EA | 72.00 | 8,280 |
| Strobe only | 61 | EA | 108.00 | 6,588 |
| A/V unit | 0 | EA | 0.00 | 0 |
| A/V unit w/ amber alert | 270 | EA | 144.00 | 38,880 |
| FS TS flow & tampers | 42 | EA | 72.00 | 3,024 |
| Fire Alarm System ( cont): | | | | |
| F Pull station | 29 | EA | 61.20 | 1,775 |
| MAG door holders | 6 | EA | 72.00 | 432 |
| ST1 stopper II 6500 | 29 | EA | 36.00 | 1,044 |
| J 4" oct j-box | 218 | EA | 33.80 | 7,368 |
| J 4" sq w/device ring | 158 | EA | 42.00 | 6,636 |
| BB back box | 331 | EA | 53.20 | 17,609 |
| Programming & pretest | 1 | EA | 1,728.00 | 1,728 |
| FFD testing & cert | 1 | EA | 1,728.00 | 1,728 |
| ir & smoke test | 1 | EA | 576.00 | 576 |
| Water flow testing | 1 | EA | 576.00 | 576 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| EMT-3/4"C-4#14 | 1,200 | LF | 5.42 | 6,504 |
| AFC-#4901-16/2 14/2 | 13,160 | LF | 4.46 | 58,694 |
| MC-4/C#14 red jacket | 13,240 | LF | 2.64 | 34,954 |
| Induct smoke | 40 | EA | 288.00 | 11,520 |
| Rem test sat | 40 | EA | 108.00 | 4,320 |
| Relay modules | 40 | EA | 72.00 | 2,880 |
| Monitor modules | 40 | EA | 72.00 | 2,880 |
| Mass notif UL listed computer | 1 | LS | 50,000.00 | 50,000 |
| Kitchen Power & Conns: | | | | |
| S clg speaker | 9 | EA | 381.00 | 3,429 |
| Wall clock | 1 | EA | 247.00 | 247 |
| Voice outlet | 1 | EA | 225.00 | 225 |
| Duplex | 36 | EA | 59.84 | 2,154 |
| J | 36 | EA | 92.00 | 3,312 |
| TML-3/4"C-3#12 | 46 | EA | 50.24 | 2,311 |
| TML-3/4"C-4#12 | 2 | EA | 61.00 | 122 |
| TML-3/4"C-5#12 | 3 | EA | 69.60 | 209 |
| TML-3/4"C-4#10 | 2 | EA | 81.80 | 164 |
| TML-1 1/4"C-4#4 & 1#/0 | 2 | EA | 132.00 | 264 |
| 60/50/3/250v | 2 | EA | 286.00 | 572 |
| 30/20/3/250v | 1 | EA | 228.00 | 228 |
| 30/3P/250v | 2 | EA | 208.00 | 416 |
| 30/2P/250v | 4 | EA | 198.00 | 792 |
| Ther sw w/OL | 9 | EA | 150.00 | 1,350 |
| EMT-3/4"C-3#12 | 2,000 | LF | 5.32 | 10,640 |
| EMT-3/4"C-4#12 | 100 | LF | 5.78 | 578 |
| EMT-3/4"C-5#12 | 160 | LF | 6.24 | 998 |
| EMT-3/4"C-4#10 | 100 | LF | 6.38 | 638 |
| EMT-1 1/4"C-4#4 & 1#10 | 100 | LF | 13.19 | 1,319 |
| MC-12/2 w/G | 1,500 | LF | 1.85 | 2,775 |
| | | LF | | |
| CO2 gas solenoid shutdown | 1 | LS | 3,404.00 | 3,404 |
| Hood/ansul/EP work | 1 | LS | 6,206.00 | 6,206 |
| Master Lightning Protector Systems & Theatre: | | | | |
| Theatrical ltg Rough-in | 1 | LS | 98,780.00 | 98,780 |
| Heary Bros Lightning Preventer Systems | 2 | EA | 13,820.00 | 27,640 |
| Window shade installation | 1 | LS | 10,760.00 | 10,760 |
| Area of refuge system | 1 | LS | 16,676.00 | 16,676 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Integrated Electronic Security: | | | | |
| Material - Turnkey: | 1 | LS | 342,000.00 | 342,000 |
| Includes: | | | | |
| DSC Main cont pnl | 1 | EA | | |
| 12v 7 AH batteries | 2 | EA | | |
| Xfmrs | 2 | EA | | |
| Key lock w/relay mod | 1 | EA | | |
| 8 Zone expansion mod | 1 | EA | | |
| 16 Zone expansion mod | 1 | EA | | |
| Addr. point modules | 12 | EA | | |
| Touchscreen keypad | 4 | EA | | |
| Wireless panic statin | 6 | EA | | |
| Wireless received mod | 1 | EA | | |
| Wall motions | 35 | EA | | |
| Clg motions | 38 | EA | | |
| Interface printer | 1 | EA | | |
| Fargo photo badging | 1 | EA | | |
| Flush door contacts | 50 | EA | | |
| OHD central contacts | 2 | EA | | |
| Cellular communicator | 1 | EA | | |
| 8 Reader controller | 11 | EA | | |
| DSX proximity readers | 18 | EA | | |
| Bosch rte motions | 14 | EA | | |
| DSC lan module/software | 1 | EA | | |
| 160 TB Network video recorder | 1 | EA | | |
| 12MP camera | 13 | EA | | |
| 5 MP ext dome camera | 2 | EA | | |
| Wall arms | 2 | EA | | |
| 5 MP Interior dome | 27 | EA | | |
| 5 MP indoor 360der dome | 29 | EA | | |
| Rack w/receivers/mx mmtrs | 1 | EA | | |
| Axis ect 360 deg camera | 3 | EA | | |
| A1 phone master video | 3 | EA | | |
| A1 phone IC-DF video door sta | 4 | EA | | |
| Strong pole split 20' | 3 | EA | | |
| 43" Smart TV | 2 | EA | | |
| 55" Smart TV | 2 | EA | | |
| Chief TV wall brkt | 4 | EA | | |
| 24 Port poe & sw | 3 | EA | | |
| 28 Port poe & sw | 10 | EA | | |
| Programming | 1 | LS | | |
| Accessories | 1 | LS | | |
| Supervision & final conn | 1 | LS | | |
| O&M manuals | 1 | LS | | |
| Auto Cad dwgs | 1 | LS | | |
| Owner training | 1 | LS | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Structured Cabling System: | | | | |
| Material - turnkey | 1 | LS | 389,939.00 | 389,939 |
| Includes: | | | | |
| ACCU tech TS teacher sta | 70 | EA | | |
| Programming | 1 | EA | | |
| Supervision & final conn | 1 | EA | | |
| O&M manuals w/closeout | 1 | EA | | |
| Auto Cad drawings | 1 | EA | | |
| Owner training | 1 | EA | | |
| 50 PR 66 blocks | 6 | EA | | |
| 25 PR 66 blocks | 6 | EA | | |
| 50 PR 110 blocks | 6 | EA | | |
| Belden 2 post rack | 8 | EA | | |
| Belden rack mt PDU | 8 | EA | | |
| Belden 4 port face plate | 150 | EA | | |
| Belden 2 port face plate | 250 | EA | | |
| Belden F conn insert | 70 | EA | | |
| Belden CAT6A green insert | 400 | EA | | |
| Belden CAT6A blue insert | 400 | EA | | |
| Belden 48 port patch pnl | 12 | EA | | |
| Belden horiz cable mgr | 40 | EA | | |
| Belden 10' patch cord | 800 | EA | | |
| Belden CAT6A plenum blue | 100 | EA | | |
| Belden CAT6A plenum green | 100 | EA | | |
| Belden OS2 sm patch cord | 100 | EA | | |
| Belden OM4 mm patch cord | 100 | EA | | |
| Belden 4 cassettes hsg | 8 | EA | | |
| Belden 6 fiber hsg | 8 | EA | | |
| Belden 18 fiber hsg | 8 | EA | | |
| Ground bars w/grd cable | 1 | LS | 23,640.00 | 23,640 |
| Conduit sleeves, cable tray and fiber backbone | 1 | LS | 30,960.00 | 30,960 |
| Intercom & Clock Systems: | | | | |
| Material - turnkey | 1 | LS | 119,970.00 | 119,970 |
| Includes: | | | | |
| Valcom 9 position back plane | 1 | EA | | |
| Valcom main power supply | 2 | EA | | |
| Valcom main VPV | 1 | EA | | |
| Valcom Rack mount kit | 1 | EA | | |
| Valcom dual 6A switching | 1 | EA | | |
| Valcom 2x2 talkback spkr | 240 | EA | | |
| Valcom call in pushbutton | 66 | EA | | |
| Valcom GPS master clock | 1 | EA | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Valcom repeater | 2 | EA | | |
| Valcom 12" round clocks | 84 | EA | | |
| Valcom administrative teleph | 1 | EA | | |
| Valcom 16" clocks/repeater | 2 | EA | | |
| Valcom wire guard | 2 | EA | | |
| Valcom power supply | 1 | EA | | |
| Cowell rack equip | 1 | LS | | |
| Atlas paging horns | 21 | EA | | |
| Atlas flush enclosures | 21 | EA | | |
| Atlas grills | 21 | EA | | |
| Valcom retro blocks | 3 | EA | | |
| Valcom power amps | 3 | EA | | |
| Valcom rack mount kit | 3 | EA | | |
| Valcom 24 pt talk back | 3 | EA | | |
| Valcom admin gateway | 1 | EA | | |
| Valcom volume control | 21 | EA | | |
| Valcom network port/cards | 1 | EA | | |
| Programming | 1 | LS | | |
| Supervisions & final conn | 1 | LS | | |
| O&M manuals & closeout | 1 | LS | | |
| Auto cad swgs & submit | 1 | LS | | |
| System testing | 1 | LS | | |
| System owner training | 1 | LS | | |
| | | | | |
| A/V Systems: | | | | |
| FSR | 1 | EA | 951.40 | 951 |
| Clg proj | 1 | EA | 700.00 | 700 |
| Duplex | 41 | EA | 60.84 | 2,494 |
| Data drop | 43 | EA | 250.00 | 10,750 |
| Hardwired AC pwr | 2 | EA | 97.00 | 194 |
| Chief PAC 526 | 3 | EA | 741.00 | 2,223 |
| VI Wall proj IG deep | 41 | EA | 44.00 | 1,804 |
| SI Wall spkr 1G deep | 82 | EA | 44.00 | 3,608 |
| RI Rec pnl 2G deep | 42 | EA | 57.80 | 2,428 |
| BP ?? 2G deep | 42 | EA | 57.80 | 2,428 |
| | | | | |
| J1 12'x12'x4" flush | 2 | EA | 203.00 | 406 |
| R2 2 gang deep | 4 | EA | 74.00 | 296 |
| R3 3 gang deep | 4 | EA | 82.00 | 328 |
| | | | | |
| S2 clg loud spkr - b.box | 10 | EA | 74.00 | 740 |
| S3 clg loud spkr - b.box | 8 | EA | 74.00 | 592 |
| EMT-1 1/4"C- w/PS | 480 | LF | 7.66 | 3,677 |
| EMT-1 "C- w/PS | 300 | LF | 6.19 | 1,857 |
| EMT-3/4"C- w/PS | 2,500 | LF | 4.63 | 11,575 |
| | | | | |
| Section 274100 A/V | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Includes Systems for: | | | | |
| Classrooms | | NIC | | |
| Auditorium | | w/equipment | | |
| Auditorium av Rough-in | 1 | EA | 45,000.00 | 45,000 |
| Switchgear Panels & Transformers: | | | | |
| 45 KVA xfmr | 8 | EA | 5,232.00 | 41,856 |
| 75 KVA xfmr | 6 | EA | 7,540.00 | 45,240 |
| Xfmr ground | 14 | EA | 394.00 | 5,516 |
| 100A/3P/480v | 3 | EA | 304.00 | 912 |
| 200A/3P/480v | 3 | EA | 372.00 | 1,116 |
| SFD 2500A @ 480v | 1 | EA | 1,788.00 | 1,788 |
| SPD panel mounted | 39 | EA | 422.00 | 16,458 |
| SPD grounds | 40 | EA | 172.00 | 6,880 |
| Elev controller | 1 | EA | 144.00 | 144 |
| 100/100A/3P/480v | 1 | EA | 339.00 | 339 |
| 30/20A/3P/208v | 1 | EA | 218.00 | 218 |
| TML 40 | 1 | EA | 204.00 | 204 |
| 100A/3/250v | 1 | EA | 274.00 | 274 |
| UPS system 24 kw | 1 | EA | 24,880.00 | 24,880 |
| Rigging for UPS | 1 | EA | 2,432.00 | 2,432 |
| EPO power off setup | 1 | EA | 274.00 | 274 |
| ST1 6500 guard | 1 | EA | 127.00 | 127 |
| Main service grounding | 1 | EA | 822.00 | 822 |
| Meter socket | 1 | EA | 544.00 | 544 |
| Main swbrd 3000A @ 480v | 1 | EA | 40,896.00 | 40,896 |
| Feeders | 136,000 | EA | 1.95 | 265,200 |
| Dist pnl 4DP1B-800A @ 480v | 1 | EA | 7,248.00 | 7,248 |
| Dist pnl 2DP1C-400A @ 208v | 1 | EA | 5,160.00 | 5,160 |
| Double tub pnl @ 120/208v | 10 | EA | 3,890.00 | 38,900 |
| Single tub pnl @ 120/208v | 12 | EA | 2,752.00 | 33,024 |
| 400A-480v pnl | 3 | EA | 5,072.00 | 15,216 |
| 225A-480v pnl | 3 | EA | 3,052.00 | 9,156 |
| 100A-480v pnl | 8 | EA | 2,688.00 | 21,504 |
| DENIS VERIFY SECONDARY FEED | | | | |
| 60% CD Adders/Deletes: | | | | |
| Integrated Electronic Security - 60% Adders/Deducts: | | | | |
| Turnkey - Includes: | 1 | EA | 27,000.00 | 27,000 |
| Reader controller - add | 1 | EA | | |
| Elevator controller - add | 3 | EA | | |
| CR REX DC DC PS - add | 1 | EA | | |
| CR DC REX PS - add | 3 | EA | | |
| Wall motions - add | 9 | EA | | |
| Ext. wall camera - add | 1 | EA | | |
| Int. dome camera - add | 1 | EA | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Int. 180 deg - add | 30 | EA | | |
| Ext. 180 deg - add | 14 | EA | | |
| Int. 360 deg - deduct | -29 | EA | | |
| Ext. 360 deg - deduct | -9 | EA | | |
| VES - add | 1 | EA | | |
| VMS - deduct | -2 | EA | | |
| OHD - DC - add | 2 | EA | | |
| Structured Cabling - 60% Adders/Deducts: | | | | |
| Turnkey - Includes: | 1 | LS | 97,000.00 | 97,000 |
| IDE closets - reduced | -1 | EA | | |
| Teachers station - add | 1 | EA | | |
| TVE - add | 4 | EA | | |
| AN - add | 115 | EA | | |
| N2D - delete | -7 | EA | | |
| 2 Data - add | 39 | EA | | |
| TVS-48 | 3 | EA | | |
| TVC-96 | 1 | EA | | |
| CAT 6A ports | 1,135 | EA | | |
| 48 Port patch pnls | 15 | EA | | |
| P.A. & Intercom - 60% CD Adders: | | | | |
| Turnkey - Includes: | 1 | LS | 20,000.00 | 20,000 |
| Speakers - add | 41 | EA | | |
| Volume control - add | 6 | EA | | |
| 12" Clocks - add | 8 | EA | | |
| Ext. flush horn spkrs - add | 2 | EA | | |
| #of classrooms - reduced | -9 | EA | | |
| IDF closets - reduced | -1 | EA | | |
| Fire Alarm & Gear - 60% Adders/Deducts: | | | | |
| FA - A/V w/ amber alert | 7 | EA | 419.00 | 2,933 |
| S - smoke w/base | 3 | EA | 162.00 | 486 |
| W WP - A/V - WP | 1 | EA | 271.00 | 271 |
| BB backbox | 7 | EA | 53.20 | 372 |
| BB WP backbox WP | 1 | EA | 63.40 | 63 |
| J - 4" oct | 3 | EA | 33.80 | 101 |
| AFC - #4901 cable | 300 | LF | 4.46 | 1,338 |
| MC - 14/4C red jacket | 50 | LF | 2.64 | 132 |
| Dist. pnl 2 DP1A - 600A @ 480 | 1 | EA | 7,248.00 | 7,248 |
| Dist. pnl 2 DP1B - 600A @ 480 | 1 | EA | 7,248.00 | 7,248 |
| Upsize ATS-LS from 150 to 200A | 1 | EA | 1,144.00 | 1,144 |
| Upsize ATS-OS from 400 to 600A | 1 | EA | 3,216.00 | 3,216 |
| Upsize G/S from 250kw to 300 kw | 1 | EA | 5,500.00 | 5,500 |
| Upsize G/S output d/b from 400 to 600A | 1 | EA | 2,000.00 | 2,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| ESL storm sw w/feeder tie | 1 | EA | 6,830.00 | 6,830 |
| Power Wiring Devices - 60% Adders/Deducts: | | | | |
| Duplex | 105 | EA | 58.84 | 6,178 |
| GFI duplex | 23 | EA | 62.84 | 1,445 |
| WP GFI duplex | 18 | EA | 94.00 | 1,692 |
| NEMA CIS 3OR | 1 | EA | 107.00 | 107 |
| 20A GFI - color | 28 | EA | 71.84 | 2,012 |
| Double duplex | 42 | EA | 113.20 | 4,754 |
| MC-10/3 | 60 | LF | 2.83 | 170 |
| $MC | 2 | EA | 70.00 | 140 |
| $DW disc sw - DW | 1 | EA | 82.00 | 82 |
| J - dishwasher | 1 | EA | 96.20 | 96 |
| J - fume hood | 1 | EA | 117.00 | 117 |
| EF | 2 | EA | 182.20 | 364 |
| SEF | 2 | EA | 182.20 | 364 |
| KEF | 1 | EA | 344.00 | 344 |
| FEF | 1 | EA | 344.00 | 344 |
| DCU | 2 | EA | 436.00 | 872 |
| CPJ - bleacher power | 1 | EA | 366.00 | 366 |
| Scoreboard power & cont. | 1 | EA | 463.00 | 463 |
| Turnkey - area of refuge AKA 2 way communication | 1 | LS | 14,953.00 | 14,953 |
| 90% CD Adders/Deducts: | | | | |
| Service, Fire Alarm - 90% CD Adders/Deducts: | | | | |
| 24 kw UPS | 1 | EA | 24,380.00 | 24,380 |
| EPO em. pwr off | 1 | EA | 491.00 | 491 |
| Disc sw. | 1 | EA | 344.00 | 344 |
| TEP2B - add section 2 | 1 | EA | 938.00 | 938 |
| MP1A - add section 2 | 1 | EA | 938.00 | 938 |
| Pnl ELIID - F&I new | 1 | EA | 3,296.00 | 3,296 |
| SPD - pnl mtd | 2 | EA | 539.00 | 1,078 |
| PNI - MHP-LR-F&I new | 1 | EA | 3,640.00 | 3,640 |
| ATS - LR-400A 4P | 1 | EA | 7,448.00 | 7,448 |
| Increase gen/set to 350 kw | 1 | EA | 7,000.00 | 7,000 |
| Add output c/b | 1 | EA | 144.00 | 144 |
| Misc. additional feeders | 1 | LS | 27,960.00 | 27,960 |
| MI cable #2 w/terms | 1 | LS | 13,320.00 | 13,320 |
| TS tamper or flow | 23 | EA | 84.00 | 1,932 |
| MM monitor module | 23 | EA | 147.00 | 3,381 |
| F pull station | 5 | EA | 126.20 | 631 |
| F - strobe | 4 | EA | 233.00 | 932 |
| S - smoke | 6 | EA | 162.00 | 972 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| J | 6 | EA | 30.20 | 181 |
| J square | 51 | EA | 36.24 | 1,848 |
| BB | 4 | EA | 46.00 | 184 |
| 4901 cable | 500 | LF | 4.46 | 2,230 |
| 14/4C cable | 2,800 | LF | 2.64 | 7,392 |
| | | | | |
| Security & Misc. Wiring Devices - 90% CD Adders/Deducts: | | | | |
| WP - ext. camera | 2 | EA | 1,125.00 | 2,250 |
| Int. camera | 3 | EA | 975.00 | 2,925 |
| CR WP | 3 | EA | 1,295.00 | 3,885 |
| IC WP | 1 | EA | 978.00 | 978 |
| Door setups - box & conduit | 4 | EA | 800.00 | 3,200 |
| CR - interior | 5 | EA | 1,295.00 | 6,475 |
| DC | 8 | EA | 275.00 | 2,200 |
| | | | | |
| Welder | 1 | EA | 184.00 | 184 |
| Duplex | 79 | EA | 58.84 | 4,648 |
| Duplex - double | 34 | EA | 124.00 | 4,216 |
| CR - clg for cord reel | 8 | EA | 128.00 | 1,024 |
| GFI | 40 | EA | 61.84 | 2,474 |
| Mech conn w/j.box | 1 | EA | 83.80 | 84 |
| G - sw. rec. w/ IL mod. | 15 | EA | 240.00 | 3,600 |
| USB - duplex w/USB outlet | 7 | EA | 133.00 | 931 |
| WP GFI | 1 | EA | 94.00 | 94 |
| Backboard gym setups | 2 | EA | 391.00 | 782 |
| MC-12/2 wG | 10,740 | LF | 1.72 | 18,430 |
| MC-6/3 wG | 100 | LF | 4.16 | 416 |
| | | | | |
| Lighting, Controls, Mechanical - 90% CD Adders/Deducts: | | | | |
| LR5D - deleted | -10 | EA | 95.00 | -950 |
| LS4B - deleted | -15 | EA | 375.00 | -5,625 |
| L - LV switch - add | 10 | EA | 230.00 | 2,300 |
| PC1 - add | 16 | EA | 480.00 | 7,680 |
| PC2 - add | 9 | EA | 480.00 | 4,320 |
| LR4 - deleted | -8 | EA | 450.00 | -3,600 |
| JB wall fixt. - add | 8 | EA | 280.00 | 2,240 |
| LS4 - add | 3 | EA | 362.00 | 1,086 |
| LP8 - add | 3 | EA | 526.00 | 1,578 |
| OS clg occ - add | 4 | EA | 420.00 | 1,680 |
| LR2 - add | 499 | EA | 385.00 | 192,115 |
| LC3 - add | 980 | LF | 97.76 | 95,805 |
| J - 4" oct j-box | 46 | EA | 30.20 | 1,389 |
| Mtg hdwre | 530 | EA | 8.20 | 4,346 |
| MC-12/2 w/ground | 2,000 | LF | 1.72 | 3,432 |
| | | | | |
| CH-1 - control conn/heat tape | 2 | EA | 591.00 | 1,182 |
| DCV-8-208v 1 30A | 2 | EA | 713.00 | 1,426 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| EFT - elec BB 2 kw 208v | 8 | EA | 571.00 | 4,568 |
| FEF - F.H. ex fan 480v 3 | 2 | EA | 942.00 | 1,884 |
| KEF-2 - ex. fan 120v 1 | 1 | EA | 541.00 | 541 |
| UH - unit heater 120v 1 | 3 | EA | 541.00 | 1,623 |
| Technology Drawings - 90% CD Adders/Deducts: | | | | |
| AN - wifi | 8 | EA | 275.00 | 2,200 |
| 2 Data | 24 | EA | 300.00 | 7,200 |
| W - wall voice | 21 | EA | 215.00 | 4,515 |
| S clg spkr | 11 | EA | 129.00 | 1,419 |
| S clg spkr | 52 | EA | 189.00 | 9,828 |
| ? | 3 | EA | 295.00 | 885 |
| S | 10 | EA | 129.00 | 1,290 |
| T | 1 | EA | 500.00 | 500 |
| IV/2D | 5 | EA | 385.00 | 1,925 |
| OH&P - 10% | 1 | LS | 500,295.85 | 500,296 |
| DJE | 1 | LS | 150,000.00 | 150,000 |
| Site Electrical Work: | | | | |
| Utilities: | | | | |
| PRI manhole dressing | 1 | EA | 1,576.00 | 1,576 |
| Utility pole PRI & FA dressing | 1 | EA | 1,364.00 | 1,364 |
| Utility pole commun. dressing | 1 | EA | 1,076.00 | 1,076 |
| Gen/set pad grndg | 1 | EA | 982.00 | 982 |
| Xfmr pad grndg | 1 | EA | 1,376.00 | 1,376 |
| Gen/set pad 90 deg. & sleeves | 1 | EA | 566.00 | 566 |
| Xfmr pad 90 deg. & sleeves | 1 | EA | 688.00 | 688 |
| Duct Bank CC: | | | | |
| PVC-4"C - w/PS (120') | 600 | LF | 4.38 | 2,628 |
| PVC-1"C- w/4#12 | 480 | LF | 3.62 | 1,738 |
| Duct Bank AA: | | | | |
| PVC-4"C - w/PS (270') | 540 | LF | 4.38 | 2,365 |
| Duct Bank BB: | | | | |
| PVC-4"C - w/PS (110') | 770 | LF | 4.38 | 3,373 |
| Duct Bank FF: | | | | |
| PVC-4"C - w/PS (120') | 240 | LF | 4.38 | 1,051 |
| Duct Bank Fire Alarm: | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| PVC-2"C - w/PS (300') | 300 | LF | 2.06 | 618 |
| IMSA 20-5 cable | 350 | LF | 3.44 | 1,204 |
| Duct Bank DD (230'): | | | | |
| PVC-4"C - w/PS | 920 | LF | 4.38 | 4,030 |
| Inner duct 1 1/4"C- w/PS | 690 | LF | 2.64 | 1,822 |
| Ext camera on 20' pole | 3 | EA | 5,470.00 | 16,410 |
| Fiber optic w/PVC | 1,000 | LF | 5.88 | 5,880 |
| Pole foundation | 3 | EA | 1,326.00 | 3,978 |
| Electrical Manhole | 2 | EA | 8,500.00 | 17,000 |
| OH&P - 10% | 1 | LS | 6,972.38 | 6,972 |
| DJE | 1 | LS | 20,000.00 | 20,000 |
| Site Lighting: | | | | |
| Lighting Fixtures: | | | | |
| SL1 - 20' pole | 37 | EA | 2,676.00 | 99,012 |
| SL3 - poulson bollard | 9 | EA | 1,812.00 | 16,308 |
| SL4 - egress permeter ltg | 21 | EA | 616.00 | 12,936 |
| SL5 - in ground bega | 16 | EA | 791.00 | 12,656 |
| SL6 - bega flood w/remote driver | 0 | EA | 0.00 | 0 |
| SL10 - mini flood | 0 | EA | 0.00 | 0 |
| SL1A - 20' pole | 4 | EA | 2,676.00 | 10,704 |
| SL3 - wall mtd area lt - MV | 4 | EA | 544.00 | 2,176 |
| HH 12x12x12"d in gr p.box | 3 | EA | 638.00 | 1,914 |
| PB 17"x30"x12"d | 12 | EA | 648.00 | 7,776 |
| PB-24"x36"x24"d w/divider | 2 | EA | 788.00 | 1,576 |
| EV charging station - level 2 | 3 | EA | 3,754.00 | 11,262 |
| J 8x8x4 inter j-box | 3 | EA | 74.00 | 222 |
| T/C 7 dy w/batt pack | 1 | EA | 666.00 | 666 |
| Pipe into & wire to exist pnl | 1 | EA | 144.00 | 144 |
| Demo exist pole w/fixt | 4 | EA | 576.00 | 2,304 |
| Penetrate m bay gym | 1 | EA | 338.00 | 338 |
| Relocated emer call box | 2 | EA | 926.00 | 1,852 |
| Call box base setup | 2 | EA | 241.00 | 482 |
| MC-12/2 w/G-fished | 540 | EA | 1.99 | 1,077 |
| PVC-1"C-3#8 | 9,320 | EA | 3.99 | 37,187 |
| Pole base anchor bolts | 48 | EA | 54.00 | 2,592 |
| Pole base grounding | 48 | EA | 162.00 | 7,776 |
| Pole base sleeves & 90 deg | 48 | EA | 137.00 | 6,576 |
| Bollard base setups | 42 | EA | 122.00 | 5,124 |
| In ground hsg setups | 16 | EA | 112.00 | 1,792 |
| PVC-2 1 /2"C-w/PS | 1,500 | EA | 3.33 | 4,989 |
| PVC-2"C-w/PS | 620 | EA | 2.77 | 1,717 |
| WP pedestal mtd Wayne Tyler CB box | 5 | EA | 1,926.00 | 9,630 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Site - 60% Deducts: | | | | |
| SL5 - Bega - in ground - delete | -11 | EA | 791.00 | -8,701 |
| Sl4 - ext. pak - delete | -6 | EA | 616.00 | -3,696 |
| J WP - wall back box -WP- delete | -6 | EA | 43.00 | -258 |
| SL3 - poulson (bollard ) - delete | -18 | EA | 1,812.00 | -32,616 |
| PVC-1"C-3#8 - delete | -1,080 | EA | 3.99 | -4,309 |
| Bollard base setups - delete | -18 | EA | 122.00 | -2,196 |
| SL10 - in grade tree ltg - add | 12 | EA | 816.00 | 9,792 |
| Exist. ltg pole to demo - delete | -4 | EA | 576.00 | -2,304 |
| SL1 - 20' pole - delete | -10 | EA | 2,676.00 | -26,760 |
| SL1A - 20' pole - delete | -4 | EA | 2,676.00 | -10,704 |
| SL3 - wall mtd area lt- delete | -4 | EA | 616.00 | -2,464 |
| MC-12/2 - fished - delete | -540 | EA | 1.99 | -1,077 |
| 8"x8"x4" interior j.box - delete | -3 | EA | 74.00 | -222 |
| T/C - 7 day w/batt pak - delete | -1 | EA | 666.00 | -666 |
| Penetrate M bay gym - delete | -1 | EA | 338.00 | -338 |
| PVC-1"C-3#8 - delete | -1,400 | EA | 3.99 | -5,586 |
| Pole base anchor bolts - delete | -14 | EA | 54.00 | -756 |
| Pole base grounding - delete | -14 | EA | 162.00 | -2,268 |
| Pole base sleeves & 90 degs - delete | -14 | EA | 137.00 | -1,918 |
| Site - 90% CD Adders/Deducts: | | | | |
| Early Site Plan - Phase 1 Dwg E-PH-1 back in | w package #1 | | | |
| HH handhole for P.V. sys | 3 | EA | 591.00 | 1,773 |
| PVC-4"C w/p.s | 600 | EA | 4.58 | 2,748 |
| PVC-2"C w/p.s | 400 | EA | 2.14 | 856 |
| PVC-2 1/2"C w/p.s | 760 | EA | 3.16 | 2,402 |
| OH&P - 10% | 1 | LS | 26,078.80 | 26,079 |
| | | | | 5,947,549 |

DIVISION 31 - EARTHWORK

310000 EARTHWORK

| | | | | |
|---|---|---|---|---|
| Site Earthwork: | | | | |
| 12" Soil @ plant bed ( 8,122 sf ) | 301 | CY | 62.00 | 18,662 |
| 3" Planting bed mulch | 76 | CY | 60.00 | 4,560 |
| 6" Loam - Lawn ( 288,987 sf ) | 5,351 | CY | 55.00 | 294,305 |
| 8" Loam - Athletic Field ( 260,744 sf ) | 6,431 | CY | 55.00 | 353,705 |
| Credit to amend existing soil | -5,900 | CY | 35.00 | -206,500 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | --- |
| | | | | 464,732 |
| 311000 SITE PREPARATION & CLEARING | | | | |
| | | | | --- |
| | | | | 0 |
| DIVISION 32 - EXTERIOR IMPROVEMENTS | | | | |
| 321000 PAVEMENT, CURBING & EDGING | | | | |
| Pedestrian Paving: | | | | |
| Site Pavement: | | | | |
| HC tactile paver | 12 | EA | 365.00 | 4,380 |
| | | | | --- |
| | | | | 4,380 |
| 323100 SITE IMPROVEMENTS | | | | |
| Basketball Court: | | | | |
| Bit pavement | 1,750 | SF | 3.00 | 5,250 |
| Color seal coat | 1,750 | SF | 6.00 | 10,500 |
| 8" Gravel | 44 | CY | 38.00 | 1,672 |
| Site Development: | | | | |
| Site Improvements: | | | | |
| Gateway and Bandstand | carried w/ building cost | | | |
| Amphitheater Seating: | | | | |
| Amphitheater earthwork | 1 | LS | 15,000.00 | 15,000 |
| Site Benches: | | | | |
| Precast bench - wood top | 20 | LF | 550.00 | 11,000 |
| Bike loop | 20 | EA | 675.00 | 13,500 |
| 8" Gravel Base | 11 | CY | 45.00 | 495 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Versa loc Block - avg 10' high | 3,200 | SF | 48.00 | 153,600 |
| Filter Fabric | 8,750 | SF | 1.10 | 9,625 |
| Allowance: | | | | |
| Trash/recycle receptacle | 10 | EA | 2,000.00 | 20,000 |
| Entry sign | 1 | LS | 30,000.00 | 30,000 |
| Electronic school zone signals | | NIC | | |
| Flag pole w/base | 1 | EA | 7,200.00 | 7,200 |
| Parking/traffic signage (C-7-5) | 27 | EA | 450.00 | 12,150 |
| *site bollard carried with misc metals | | | | |
| | | | | 289,992 |
| 328000 IRRIGATION | | | | |
| Irrigate sod | 41,496 | SF | 2.00 | 82,992 |
| Irrigation System- Repair/Replace | 82,800 | SF | 1.00 | 82,800 |
| | | | | 165,792 |
| 329000 LANDSCAPING | | | | |
| Plantings: | | | | |
| Trees: | | | | |
| Sheet L2.0: | | | | |
| AC Shadblow Serviceberry (2.5-3" cal) | 1 | EA | 775.00 | 775 |
| AL Allegheny Serviceberry (2.5-3" cal) | 12 | EA | 775.00 | 9,300 |
| CK American Yellowwood (3-3.5" cal) | 17 | EA | 900.00 | 15,300 |
| FG American Beech (3-3.5" cal) | 11 | EA | 900.00 | 9,900 |
| NS Black Tupelo (3-3.5" cal) | 8 | EA | 900.00 | 7,200 |
| OA Sourwood (2.5-3" cal) | 3 | EA | 775.00 | 2,325 |
| PA London Plane Tree (3-3.5" cal) | 24 | EA | 900.00 | 21,600 |
| QP Pin Oak (3-3.5" cal) | 7 | EA | 900.00 | 6,300 |
| QR Red Oak (3-3.5" cal) | 7 | EA | 900.00 | 6,300 |
| Sheet L2.1: | | | | |
| AR Red Maple (3-3.5" cal) | 6 | EA | 900.00 | 5,400 |
| CK American Yellowwood (3-3.5" cal) | 7 | EA | 900.00 | 6,300 |
| LT Tulip Tree (3-3.5" cal) | 8 | EA | 900.00 | 7,200 |
| NS Black Tupelo (3-3.5" cal) | 7 | EA | 900.00 | 6,300 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Shrubs: | | | | |
| CA Sweet Pepperbush (3.5-4' ht) | 28 | EA | 215.00 | 6,020 |
| HQ Oak Leaf Hydrangea (3-3.5' ht) | 49 | EA | 200.00 | 9,800 |
| HV Witch Hazel (7-8' B&B) | 3 | EA | 450.00 | 1,350 |
| IG Inkberry (4-4.5' ht) | 33 | EA | 265.00 | 8,745 |
| IV Winterberry (2.2.5' ht) | 61 | EA | 185.00 | 11,285 |
| JH Creeping Juniper (15-24" spd) | 68 | EA | 50.00 | 3,400 |
| JV Easter Red Cedar (7-8' ht) | 26 | EA | 450.00 | 11,700 |
| MG Sweetgale (3.5-4' ht) | 38 | EA | 215.00 | 8,170 |
| PF Pink Beauty Potentilla (24" spd) | 22 | EA | 65.00 | 1,430 |
| RA Grow Low Sumac (2-2.5' spd) | 47 | EA | 80.00 | 3,760 |
| RT Staghorn Sumac (3 gal) | 13 | EA | 135.00 | 1,755 |
| VA Lowbush Blueberry (15-24" spd) | 53 | EA | 50.00 | 2,650 |
| VD Arrowwood (4-4.5' ht) | 31 | EA | 265.00 | 8,215 |
| VT Dwarf Cranberry Bush (3-3.5' ht) | 12 | EA | 265.00 | 3,180 |
| Groundcover: | | | | |
| Sheet L2.0: | | | | |
| CP Sweet Fern (1 gal) | 1,436 | EA | 36.00 | 51,696 |
| Sheet L2.1: | | | | |
| CP Sweet Fern (1 gal) | 530 | EA | 36.00 | 19,080 |
| Plant Maintance | 1 | LS | 10,000.00 | 10,000 |
| Sod: | | | | |
| Sod at Amphitheater | 25,334 | SF | 1.10 | 27,867 |
| Rake , Seed, Fertilize New Lawns: | | | | |
| Lawn | 119,912 | SF | 0.26 | 31,177 |
| Meadow Mix | 143,741 | SF | 0.28 | 40,247 |
| Pea Stone drip edge | 996 | SF | 12.00 | 11,952 |
| Sports field | 260,744 | SF | 0.30 | 78,223 |
| Stone Dust - mech yard | 500 | SF | 4.00 | 2,000 |
| | | | | 457,903 |

DIVISION 33 - UTILITIES

330000 UTILITIES

Fuel Distribution:

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| BASE COST ESTIMATE | | | | |
| Electrical Utilities: | | | | |
| Generator Pad | 200 | SF | 25.00 | 5,000 |
| Transformer pad | 200 | SF | 25.00 | 5,000 |
| Site Lighting: | | | | |
| Site light trenching | 10,500 | LF | 18.50 | 194,250 |
| Trench, Backfill and Concrete: | | | | |
| Electric Ductbank | 1,150 | LF | 76.00 | 87,400 |
| | | | | 291,650 |

| | | | |
|---|---|---|---|
| PROJECT: | Fuller Middle School | NO. OF SQ. FT.: | 136,600 |
| LOCATION: | Framingham, MA | COST PER SQ. FT.: | 63.76 |
| CLIENT: | SMMA Architects | | |
| DATE: | 26-Sep-19 | | |

No.: 18020

**EARLY SITE PACKAGE #1**

| SUMMARY | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |
|---|---|---|---|
| **DIVISION 02 - EXISTING CONDITIONS** | | | |
| **DIVISION 31 - EARTHWORK** | | | |
| 310000 EARTHWORK | 5,387,568 | 62% | 39.44 |
| 311000 SITE CLEARING | 756,447 | 9% | 5.54 |
| **DIVISION 32 - EXTERIOR IMPROVEMENTS** | | | |
| 321000 BASES, BALLASTS AND PAVING | 64,350 | 1% | 0.47 |
| 323000 SITE IMPROVEMENTS | 1,486,262 | 17% | 10.88 |
| **DIVISION 33 - UTILITIES** | | | |
| 330000 UTILITIES | 1,015,510 | 12% | 7.43 |
| | --- | | |
| DIRECT COST | 8,710,136 | 100% | 63.76 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 31 - EARTHWORK | | | | |
| 310000 EARTHWORK | | | | |
| Foundations: | | | | |
| Ground Improvements: | | | | |
| Geopiers | 74,000 | FTP | 10.50 | 777,000 |
| Rigid Inclusion towards RB - 1 and RB - | 1 | LS | 50,000.00 | 50,000 |
| Foundation Earthwork: | | | | |
| Surcharge Bldg Footprint | 1 | LS | 300,000.00 | 300,000 |
| Excavate Footings | 3,000 | CY | 15.00 | 45,000 |
| Backfill Foundation | 1,400 | CY | 15.00 | 21,000 |
| Slab Fill | 2,000 | CY | 28.00 | 56,000 |
| Dewatering | 1 | LS | 25,000.00 | 25,000 |
| Foundation drain (1/S300) | 120 | LF | 38.00 | 4,560 |
| Slab on Grade: | | | | |
| 12" Gravel base - SOG | 2,372 | CY | 34.00 | 80,648 |
| Site Earthwork: | | | | |
| Phase 1/2: | | | | |
| Site Cut | 2,847 | CY | 12.00 | 34,164 |
| Stockpile cut | 2,847 | CY | 10.00 | 28,470 |
| Site Fill - supply | 15,810 | CY | 18.00 | 284,580 |
| Phase 3: | | | | |
| Site Cut | 21,721 | CY | 10.25 | 222,640 |
| Site Fill - reuse mat'l | 21,721 | CY | 11.00 | 238,931 |
| Site Fill - supply | 18,000 | CY | 18.00 | 324,000 |
| Site Rough Grading | 101,781 | SY | 2.30 | 234,096 |
| Layout, Mobilization, Supervision | 1 | LS | 250,000.00 | 250,000 |
| Temp Drainage | | N/A | | |
| Dust Control | 1 | LS | 10,000.00 | 10,000 |
| Street Sweeping | 1 | LS | 10,000.00 | 10,000 |
| Surcharge Ampitheater | 1 | LS | 200,000.00 | 200,000 |
| Soils | 1 | LS | 2,118,778.00 | 2,118,778 |
| Soil Management: | | | | |
| Dispose of contaminated soil - less than F | 2,550 | TONS | 14.00 | 35,700 |
| Dispose of contaminated soil - unlined | 850 | TONS | 40.00 | 34,000 |
| Add New Site Fill | 4,000 | CY | 0.75 | 3,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | 5,387,568 |

311000 SITE CLEARING

| | | | | |
|---|---|---|---|---|
| Site Preparation: | | | | |
| Phase One: | | | | |
| Jersey barriers | 1,533 | LF | 75.00 | 114,975 |
| Temp pavement | 98,683 | SF | 1.50 | 148,025 |
| Phase 1 - Grading & Drainage | | | | |
| Erosion control | 701 | LF | 7.50 | 5,258 |
| Site prep | 101,316 | SF | 0.20 | 20,263 |
| Phase 2 - Grading & Drainage: | | | | |
| Temp erosion basin Eroison control | 307 | LF | 15.00 | 4,605 |
| Construction entrance | 1 | EA | 7,500.00 | 7,500 |
| Construction fence | 3,200 | LF | 12.00 | 38,400 |
| Erosion control | 2,500 | LF | 6.00 | 15,000 |
| Drain inlet protection | 25 | EA | 50.00 | 1,250 |
| Erosion control maintenance | 1 | LS | 15,000.00 | 15,000 |
| Strip & stack top soil - 6" | 5,900 | CY | 9.25 | 54,575 |
| Selective Clear and Grub | 1 | LS | 20,000.00 | 20,000 |
| Saw cut walk | 25 | LF | 5.00 | 125 |
| Saw cut drive | 25 | LF | 5.00 | 125 |
| Site - Remove Existing: | | | | |
| Cut and Cap | 1 | LS | 5,000.00 | 5,000 |
| Sanitary and Drain pipe | 1,435 | LF | 35.00 | 50,225 |
| Water Line | 900 | LF | 31.00 | 27,900 |
| Utility structures | 10 | EA | 425.00 | 4,250 |
| Wood guardrail | 300 | LF | 15.00 | 4,500 |
| Bit walk | 201,786 | SF | 0.85 | 171,518 |
| Conc. walk | 14,967 | SF | 1.00 | 14,967 |
| Bit Walkway | 8,874 | SF | 0.90 | 7,987 |
| Misc. site demolition | 1 | LS | 25,000.00 | 25,000 |
| | | | | 756,447 |

DIVISION 32 - EXTERIOR IMPROVEMENTS

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| 321000 BASES, BALLASTS AND PAVING | | | | |
| Pedestrian Paving: | | | | |
| Bit sidewalk | 1,862 | SY | 27.00 | 50,274 |
| 8" Gravel Base | 414 | CY | 34.00 | 14,076 |
| | | | | 64,350 |
| 323000 SITE IMPROVEMENTS | | | | |
| Roadways: | | | | |
| Phase 1: | | | | |
| Bit pavement - parking and drive | 8,147 | SY | 27.50 | 224,043 |
| Raised Road Pavement w/ stamped finish | 10,500 | SF | 15.00 | 157,500 |
| 12" Gravel base | 2,715 | SY | 32.00 | 86,880 |
| PCC- RAD | 320 | LF | 32.00 | 10,240 |
| PCC - straight | 1,130 | LF | 26.00 | 29,380 |
| SGC - straight | 189 | LF | 39.50 | 7,466 |
| VGC - RAD | 79 | LF | 46.00 | 3,634 |
| VGC - straight | 365 | LF | 42.00 | 15,330 |
| Line Painting | 1 | LS | 5,000.00 | 5,000 |
| Phase 2: | | | | |
| Bit pavement | 182 | SF | 30.00 | 5,460 |
| 12" Gravel base | 61 | SY | 35.00 | 2,135 |
| Base: | | | | |
| Bit firelane pavement | 1,685 | SY | 27.00 | 45,495 |
| Bit pavement | 14,204 | SY | 27.00 | 383,508 |
| 12" Gravel base | 5,296 | CY | 32.00 | 169,472 |
| VGC radial | 1,646 | LF | 46.00 | 75,716 |
| VGC straight | 2,297 | LF | 42.00 | 96,474 |
| Line Painting | 1 | LS | 7,500.00 | 7,500 |
| Street Patch at New Curb | 1,154 | LF | 50.00 | 57,700 |
| Pavement patch @ utilities | 1 | LS | 15,000.00 | 15,000 |
| Site Development: | | | | |
| Manual vehicle gate 20'w | 1 | EA | 4,800.00 | 4,800 |
| Vehicular guardrail - wood | 952 | LF | 65.00 | 61,880 |
| Utility Bollard | 13 | EA | 1,050.00 | 13,650 |
| Basketball hoop | 2 | EA | 4,000.00 | 8,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| | | | | --- |
| | | | | 1,486,262 |
| DIVISION 33 - UTILITIES | | | | |
| 330000 UTILITIES | | | | |
| Water: | | | | |
| Phase 1 - Grading & Drainage | | | | |
| 2" Water | 21 | LF | 70.00 | 1,470 |
| 6" Water | 168 | LF | 92.00 | 15,456 |
| CTE water | 5 | EA | 3,000.00 | 15,000 |
| Fire hydrant | 3 | EA | 2,250.00 | 6,750 |
| 6" Gate Valve | 4 | EA | 1,400.00 | 5600 |
| Misc Valves | 4 | EA | 1,400.00 | 5600 |
| Phase 2 - Grading & Drainage: | | | | |
| 2" Water line | 147 | LF | 62.50 | 9,188 |
| 6" Water line | 717 | LF | 88.00 | 63,096 |
| Fire hydrant | 1 | EA | 2,250.00 | 2,250 |
| 6" Gate Valve | 1 | EA | 1,400.00 | 1400 |
| Misc Valves | 2 | EA | 1,400.00 | 2800 |
| Site Connection | 1 | LOC | 7,500.00 | 7,500 |
| Sanitary Sewer: | | | | |
| Phase 2 - Grading & Drainage: | | | | |
| 8" PVC san | 606 | LF | 80.00 | 48,480 |
| Sewer manhole | 3 | EA | 4,100.00 | 12,300 |
| EGI-1 | 1 | EA | 12,500.00 | 12,500 |
| Acid Waste tank | 1 | LS | 15,000.00 | 15,000 |
| Exist. sanitary manhole - site conn. | 1 | EA | 7,500.00 | 7,500 |
| Storm Sewer: | | | | |
| Phase 1 - Grading & Drainage | | | | |
| 12" HDPE | 33 | LF | 76.00 | 2,508 |
| 18" HDPE | 531 | LF | 94.00 | 49,914 |
| 24" HDPE | 63 | LF | 145.00 | 9,135 |
| 30" HDPE | 10 | LF | 210.00 | 2,100 |
| 6" PVC | 45 | LF | 62.50 | 2,813 |
| Catch Basin | 6 | EA | 2,100.00 | 12,600 |
| CTE drainage | 1 | EA | 4,000.00 | 4,000 |
| Cut & patch existing parking lot | 431 | LF | 50.00 | 21,550 |
| Drain man hole | 3 | EA | 4,100.00 | 12,300 |
| Head wall | 1 | LS | 6,500.00 | 6,500 |
| STC 6000 | 1 | EA | 60,000.00 | 60,000 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| STC 3600 | 1 | EA | 30,000.00 | 30,000 |
| STC 450i | 2 | EA | 11,500.00 | 23,000 |
| Phase 2 - Grading & Drainage: | | | | |
| 12" HDPE | 154 | LF | 76.00 | 11,704 |
| Catch Basin | 2 | EA | 4,100.00 | 8,200 |
| Temp drain line | 282 | LF | 100.00 | 28,200 |
| Phase 3 ( per revised plane 4 /17/19): | | | | |
| 12" HDPE | 262 | LF | 76.00 | 19,912 |
| 15" HDPE | 665 | LF | 84.00 | 55,860 |
| 18" HDPE | 152 | LF | 94.00 | 14,288 |
| 24" HDPE | 305 | LF | 145.00 | 44,225 |
| 30" HDPE | 537 | LF | 182.00 | 97,734 |
| Catch Basin | 10 | EA | 4,100.00 | 41,000 |
| CB Conversion | 1 | EA | 1,200.00 | 1,200 |
| Drain Manhole | 9 | EA | 4,100.00 | 36,900 |
| Head Wall | 1 | EA | 7,500.00 | 7,500 |
| Outfall wier construction | 1 | LS | 5,000.00 | 5,000 |
| Infiltration field | 1,292 | SF | 25.00 | 32,300 |
| *EXCLUDES WORK SOUTH OF FLAGG DRIVE | | | | |
| Fuel Distribution: | | | | |
| Phase 2 - Grading & Drainage: | | | | |
| Gas trench | 311 | LF | 48.00 | 14,928 |
| Gas Pipe | | By utility | | |
| Service Meter Pad | 1 | EA | 2,500.00 | 2,500 |
| Electrical Distribution: | | | | |
| Light Pole base - 12' Precast | 37 | EA | 1,350.00 | 49,950 |
| Temporary Electrical Service | 1 | LS | 75,800.00 | 75,800 |
| | | | | 1,015,510 |

| | | | |
|---|---|---|---|
| PROJECT: | Fuller Middle School | NO. OF SQ. FT.: | 136,600 |
| LOCATION: | Framingham, MA | COST PER SQ. FT.: | 53.73 |
| CLIENT: | SMMA Architects | | |
| DATE: | 26-Sep-19 | | |

No.: 18020

**EARLY SITE PACKAGE #2**

| SUMMARY | DIVISION TOTAL | PERCENT OF PROJECT | COST PER SF |
|---|---|---|---|
| **DIVISION 03 - CONCRETE** | | | |
| 033000 CAST IN PLACE CONCRETE | ####### | 46% | 24.48 |
| **DIVISION 05 - METALS** | | | |
| 051000 STRUCTURAL METAL FRAMING | ####### | 54% | 29.06 |
| **DIVISION 07 - THERMAL & MOISTURE PROTECTION** | | | |
| 071000 DAMPPROOFING & WATERPROOFING | 26,170 | 0% | 0.19 |
| DIRECT COST | ####### | 100% | 53.73 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 03 - CONCRETE | | | | |
| 033000 CAST IN PLACE CONCRETE | | | | |
| Foundations: | | | | |
| Column Footing - (F 3 thru F 12 @ 135 ea): | | | | |
| 4000 psi, NW, (incl. placement) | 454 | CY | 205.00 | 93,070 |
| Formwork | 6,300 | SFCA | 9.50 | 59,850 |
| Rebar | 45,400 | LBS | 1.22 | 55,388 |
| **unit cost $458.83* | | | | |
| Perim Wall Footing 1' x 3'/4' ( 1,578 LF ): | | | | |
| 4000 psi, NW, (incl. placement) | 180 | CY | 208.00 | 37,440 |
| Formwork | 3,200 | SFCA | 8.10 | 25,920 |
| Rebar | 9,000 | LBS | 1.22 | 10,980 |
| **unit cost $413.00* | | | | |
| Foundation Wall 16" thick x height varies ( 1,962 lf): | | | | |
| 4000 psi, NW, (incl. placement) | 442 | CY | 215.00 | 95,030 |
| Formwork - 4' or less | 8,808 | SFCA | 14.00 | 123,312 |
| Formwork - 4' Aud/Gym | 4,960 | SFCA | 14.00 | 69,440 |
| Formwork - 15' | 3,120 | SFCA | 20.00 | 62,400 |
| Brick Shelf | 1,962 | LF | 14.50 | 28,449 |
| Reinforcing steel | 66,300 | LBS | 1.22 | 80,886 |
| **unit cost $1,039.63* | | | | |
| Auditorium Interior Foundations - Stage front: | | | | |
| Wall footing | 32 | CY | 350.00 | 11,200 |
| 12" Knee wall | 27 | CY | 850.00 | 22,950 |
| Loading Dock: | | | | |
| Wall footing | | inc. above | | |
| Foundation wall | 36 | CY | 975.00 | 35,100 |
| Misc. Foundations: | | | | |
| CMU Footing - aud/gym | 28 | CY | 385.00 | 10,780 |
| #1 - #5 Grade Beam | 42 | CY | 675.00 | 28,350 |
| 12" Elevator mat | 6 | CY | 650.00 | 3,900 |
| Elev sump pit | 1 | EA | 900.00 | 900 |
| 12" Elevator pit wall -5'D | 7 | CY | 900.00 | 6,300 |
| Interior Mechanical pads - allow | 1 | LS | 5,000.00 | 5,000 |
| Concrete Pilaster | 28 | CY | 1,100.00 | 30,800 |
| Setting Anchor Bolts and Grout | 132 | EA | 310.00 | 40,920 |
| *Includes Section 031000 - 033500 | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Band Shell Foundation: | | | | |
| Wall Footing 1' x 5' | 6 | CY | 800.00 | 4,800 |
| 16" Radial Found wall | 9 | CY | 1,300.00 | 11,700 |
| Slab on Grade: | | | | |
| 5" Slab on Grade - Typ: | | | | |
| 3,500 psi, NW, (incl. placement) | 988 | CY | 228.00 | 225,264 |
| 6x6 W2.9 X W2.9 | 64,048 | SF | 1.80 | 115,286 |
| Control Joint | 4,300 | LF | 2.60 | 11,180 |
| 15 Mil poly vapor barrier (2/A100) | | w/072600 | | |
| Trowel Finish | 64,048 | SF | 2.10 | 134,501 |
| *unit cost $7.59 | | | | |
| Misc. Slabs and Concrete: | | | | |
| Premium Stepped/sloped slab | 3,460 | SF | 8.00 | 27,680 |
| Ext. 5" Loading Dock | 1,125 | SF | 9.00 | 10,125 |
| Ext. Loading Dock Stair Structure | 1 | FLT | 7,500.00 | 7,500 |
| Gyp cement underlayment(spec 035413) | | w/C3020 | | |
| Floor Construction: | | | | |
| 3 1/4" LW Deck fill - typ floor | 68,431 | SF | 9.80 | 670,624 |
| 3 1/4" LW Deck fill - stage plenum (7/A | 570 | SF | 10.00 | 5,700 |
| Roof Construction: | | | | |
| 3 1/4" LW Deck fill : | | | | |
| R 6.25 3" x 18 Ga. Comp Deck- Typ | 3,641 | SF | 8.70 | 31,677 |
| 3 1/4" LW Deck fill : | | | | |
| R 5.5 3" x 18 Ga. Comp Deck- Typ | 29,586 | SF | 8.70 | 257,398 |
| Roof top 1'W x 2'H Concrete Curb @: | | | | |
| Mech RTU unit | 618 | LF | 92.00 | 56,856 |
| Misc Equip curbs | 1 | LS | 9,998.00 | 9,998 |
| Stair Construction: | | | | |
| Conc stair pan fill : | | | | |
| Metal pan stair treads and risers | 1,278 | LFR | 22.00 | 28,116 |
| Metal pan landing | 472 | SF | 18.00 | 8,496 |
| Aud cast stair @ grade (4 flt) | 48 | LFT | 145.00 | 6,960 |
| Floor Finishes: | | | | |
| PC Power Troweled Concrete Floor Finish:: | | | | |
| Auditorium | 3,788 | SF | 5.00 | 18,940 |
| Makerspace ( 1 EA) | 1,972 | SF | 5.00 | 9,860 |
| SITEWORK: | | | | |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Pedestrian Paving: | | | | |
| Site Pavement: | | | | |
| Entry Stoop | 200 | SF | 22.00 | 4,400 |
| Concrete sidewalk | 21,127 | SF | 11.00 | 232,397 |
| Plaza Paving | 1,760 | SF | 20.00 | 35,200 |
| Site Development: | | | | |
| Pavilion Amphitheater Step: | | | | |
| Amphitheater stair foundation | 5 | CY | 1,100.00 | 5,500 |
| Amphitheater stair tread (radial) | 385 | LF | 190.00 | 73,150 |
| Ramp and Planter Walls: | | | | |
| Wall Footing | 25 | CY | 475.00 | 11,875 |
| 12" Foundation Wall | 82 | CY | 1,600.00 | 131,200 |
| Ramp Slab | 510 | SF | 15.00 | 7,650 |
| Sandblast finish | 1 | LS | 10,000.00 | 10,000 |
| Site Stair: | | | | |
| Site stair foundation | 38 | CY | 1,100.00 | 41,800 |
| Site stair tread | 251 | LF | 110.00 | 27,610 |
| Main stair tread | 193 | LF | 110.00 | 21,230 |
| Bike Conc Pad | 426 | SF | 25.93 | 11,046 |
| Foundations: | | | | |
| 2" Rigid found. insul w/ 1/2" drain bed - | 1,360 | SF | 6.00 | 8,160 |
| 2" Rigid found. insul - frost wall | 6,884 | SF | 3.20 | 22,029 |
| Slab on Grade: | | | | |
| Stegro vapor barrier (15 mil) | 64,048 | SF | 1.71 | 109,522 |
| | | | | 3,343,795 |

DIVISION 05 - METALS

051000 STRUCTURAL METAL FRAMING

| | | | | |
|---|---|---|---|---|
| Floor Construction: | | | | |
| Wide Flange - beam | 210.52 | TONS | 3,800.00 | 799,976 |
| HSS Beam | 36.2 | TONS | 3,900.00 | 141,180 |
| HSS Brace Frame | 46.7 | TONS | 4,200.00 | 196,140 |
| Wide Flange- Column | 10.7 | TONS | 3,550.00 | 37,985 |
| HSS Column | 88.3 | TONS | 3,900.00 | 344,370 |
| Bolted Ledger Angle | 1.5 | TONS | 3,550.00 | 5,325 |
| Relieving angle (S500) | 1,043 | LF | 185.00 | 192,955 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| Wide flange - stage front | 0.5 | TON | 3,700.00 | 1,850 |
| 4" x 4" x 1/8" Bolted angle at found - allc | 250 | LF | 65.00 | 16,250 |
| Hilti bolt conn | 74 | EA | 128.00 | 9,472 |
| Moment Connection | 194 | EA | 1,300.00 | 252,200 |
| Shear stud ( 10/100sf) | 16,200 | EA | 5.25 | 85,050 |
| Atrium coped Beam Detailing #4/S500 | 1 | LS | 49,402.00 | 49,402 |
| Roof Construction: | | | | |
| Wide Flange - beam | 200.8 | TONS | 3,800.00 | 763,040 |
| HSS Beam | 61.0 | TONS | 4,100.00 | 250,100 |
| DLH Bar Joist | 47.84 | TONS | 3,657.00 | 174,951 |
| HD Galv pipe/ HSS Roof Screen | 4.70 | TONS | 5,200.00 | 24,440 |
| HD Galv HSS Entrance Canopy | 2.60 | TONS | 6,000.00 | 15,600 |
| HSS Brace Frame | w/ floor construction | | | |
| Wide Flange- Column | w/ floor construction | | | |
| HSS Column | w/ floor construction | | | |
| Bolted Ledger Angle | 3 | TONS | 3,550.00 | 10,650 |
| Hilti bolt conn | 140 | EA | 128.00 | 17,920 |
| Moment connection | 38 | EA | 750.00 | 28,500 |
| Galv Roof Dunnage: | | | | |
| CH/WF | 9 | TONS | 4,500.00 | 40,500 |
| HSS post | 1 | TONS | 4,500.00 | 4,140 |
| Angle brace | 500 | LBS | 4.00 | 2,000 |
| Site Development: | | | | |
| HD Color Galv HSS/ C Channel Band Sh | 3.40 | TONS | 10,000.00 | 34,000 |
| Floor Construction: | | | | |
| 3" x 18 Ga. Comp Deck- Typ | 68,431 | SF | 3.40 | 232,665 |
| 3" x 18 Ga. Comp Deck- stage | 570 | SF | 3.60 | 2,052 |
| Roof Construction: | | | | |
| R 1.5 1 1/2" x 20Ga Roof deck | 765 | SF | 2.80 | 2,142 |
| R3 3" X 18 Ga. Typical Roof Deck | 13,702 | SF | 3.00 | 41,106 |
| R 6.25 3" x 18 Ga. Comp Deck- Typ | 3,641 | SF | 3.18 | 11,578 |
| R 5.5 3" x 18 Ga. Comp Deck- Typ | 29,586 | SF | 3.18 | 94,083 |
| R 1.5A 1 1/2" Acoustical Roof Deck - gy | 8,835 | SF | 7.25 | 64,054 |
| R3C 3" Roof Deck - aud (acoustical dele | 7,563 | SF | 3.15 | 23,823 |
| | | | | 3,969,500 |

| DESCRIPTION | QUANTITY | UNIT | UNIT COST | TOTAL |
|---|---|---|---|---|
| DIVISION 07 - THERMAL & MOISTURE PROTECTION | | | | |
| 071000 DAMPPROOFING & WATERPROOFING | | | | |
| Bid Page #2 Foundation Waterproofing | 1 | LS | 26,170.00 | 26,170 |
| | | | | 26,170 |