MERCHANTS METALS®

SECTION 323119.10 – SECURE WELD PLUS® DECORATIVE ORNAMENTAL STEEL FENCE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Decorative ornamental galvanized metal tubular picket fence system.

B. Related Sections:
   1. Division 03 Concrete
   2. Division 31 Earthwork

1.3 REFERENCES

A. American Society for Testing Materials:
   1. A239 Practice for Locating the Thinnest Spot in a Zinc(Galvanized) Coating on Iron or Steel Articles
   2. A653/A653M Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
   3. A1008/A1008M Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High- Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
   4. A1011/A1011M Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low- Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
   5. B117 Practice for Operating Salt Spray (Fog) Apparatus
   6. D523 Test Method for Specular Gloss
   7. D714 Test Method for Evaluating Degree of Blistering of Paints
   8. D1654 Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
   9. D2244 Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
   10. D2794 Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
   11. D3359 Test Methods for Measuring Adhesion by Tape Test
   12. E4 Practices for Force Verification of Testing Machines
   13. F2814 Guide for Design and Construction of Ornamental Steel Picket Fence Systems for Security Purposes
   14. F2408 Standard Specification for Ornamental Fences Employing Galvanized Steel Tubular Pickets

1.4 SUBMITTALS

A. Product Data: Manufactures information for each type of product indicated.
B. Shop Drawings: Product elevations, sections, and details as necessary.
C. Product Warranty: Pickets, Posts, and Rails standard limited warranty that ornamental fence system is free from defects in material and workmanship including cracking, peeling, blistering and corroding for a period of 10 years from the date of purchase.

1.5 QUALITY ASSURANCE

A. The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and the materials and techniques specified.

B. Provide complete fence system and gates, with all components provided by a single manufacturer, including all panels, posts, gates, fittings and hardware.
C. Manufacturer Qualifications: Company specializing in manufacturing of steel ornamental picket fence systems with a minimum of 5 years documented experience.

1.6 PRODUCT HANDLING AND STORAGE

A. Panels, gates, posts, and accessories to be delivered to the project site assembled and coated. Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping.
B. Materials shall be handled and stored properly to protect against damage, weather, vandalism and theft.

PART 2 – PRODUCTS

2.1 SECURE WELD PLUS® DECORATIVE ORNAMENTAL STEEL FENCE

A. A. Approved manufacture: Merchants Metals® www.merchantsmetals.com
Phone: (888) 260-1600 Fax: (888) 261-3600 tech-info@merchantsmetals.com
B. Products from other qualified manufacturers who have ten years or more experience manufacturing steel ornamental picket fencing will be considered by the architect as equal if approved in writing 10 days prior to biddings, and they meet all specifications for design, size, and gauge of metal parts and fabrication. Picket fences and gates must be obtained from a single source.
C. Securely welded biasable fence system shall rack 45 degrees based on an 8' nominal panel if required.
D. Choose style: Lafayette, Kent, Monroe (Non-Biasable), or Curve Top.
E. Choose nominal height: 4', 5', 6', 8', or Custom.
F. Pickets, Posts, and Rails: Galvanized square steel tubular members manufactured per ASTM F2408, having minimum yield strength of 45,000 psi. Choose one: Residential, Commercial, or Industrial.
    1. Residential: Picket 5/8" square 18 gauge with pickets 4-9/16" O.C., Rail 1" square 16 gauge, actual panel width 94", 120", or custom.
    2. Commercial: Picket 3/4" square 16 gauge 4-3/4" O.C., Rail 1-1/2" square 14 gauge, actual panel width 94", 120", or custom.
    3. Industrial: Picket 1" square 16 gauge 5" O.C., Rail 2" square 14 gauge, actual panel width 94", 120", or custom.
G. Finish: Manufactured in compliance with ASTM F2408 - Corrosion Resistance Salt Spray Test per ASTM B117, Impact Resistance per ASTM D2794, and Adhesion per ASTM D3359 Method B. All primary components shall receive a thorough cleaning and pre-treatment with a 10-step process: Hot alkaline cleaner, clear water rinse, hot iron phosphate application, clear water rinse, reverse Osmosis rinse, dry off oven heat, zinc enriched powder primer coat at 2-4 mils., gel oven heat, Ultra polyester finish T.G.I.C. powder coat at 2-4 mils., and final curing oven.
Choose color: Black, Brown, White, Green, Almond, or Custom.

2.2 ACCESSORIES

A. Rail/Post Bracket – Bracket system ensures easy installation without the need to weld in the field.
B. Post Caps: Cast aluminum or malleable iron or formed steel manufactured to form a weather-tight closure. Choose Cap style: Ball or flat tops - on all posts.

C. Rings: Decorative rings as required.
D. Finial Tops for Pickets – Choose: Square Top, Quad Flair with Ball or Triad Spear.

2.3 GATES

A. Ornamental picket swing gates (see section 32 31 19.20)
B. Ornamental picket pre-hung gates (see section 32 31 19.30)
C. Ornamental picket cantilever slide gates (see section 32 31 19.40)

2.4 SETTING MATERIALS

A. Concrete: Minimum 28 day compressive strength of 3,000 psi.
B. Flanged Post: Provide flanged base plates with 4 holes for surface mounting where indicated. (For wall mount or pad mount situations.)

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify areas to receive fencing are completed to final grades and elevations.
B. Property lines and legal boundaries of work to be clearly established by the general contractor or property owner.

3.2 FENCE INSTALLATION

A. Install fence per manufacturer's recommendations.
B. Space posts uniformly at manufactures standard face to face of post dimension unless instructed otherwise.
C. Set posts in concrete. Dig holes having a diameter 4 times the diameter of the post, and 6" deeper than the bottom of the post. Crown concrete at top to shed water.

3.3 CLEANING

A. Clean up debris and remove from the site.

END OF SECTION

SECTION 01 11 00

SUMMARY OF THE PROJECT

PART 1 - GENERAL

1.01 WORK OF THE CONTRACTOR:

A. Scope of Work: Contractor shall perform, within the time stipulated, the Contract, including all of its component parts, and everything required to be performed, and to provide and furnish any and all of the labor, materials, tools, expendable equipment, and all applicable taxes, and all utility and transportation services necessary to perform the Contract and complete, in a workmanlike manner, all of the Work required in connection with the following titled Project in strict conformity with the Contract Documents:

BALBOA ELEMENTARY SCHOOL
FENCING PROJECT
1844 Bel Aire Drive
Glendale, California 91201

B. Phasing: Refer to Section 01 11 25 Phasing for Project Phasing Requirements, including milestones.

C. This school is on a traditional school year calendar, August through June. During the period of this contract, school events and educational requirements will limit or prevent access, and will affect Contractor work hours for a portion or all of the school building (s) pertinent to the contract. Contractor shall maintain schedule with full knowledge of these times and dates to be determined. A site-specific calendar will include currently known dates of limited access, or times of the school day that noise will have to be limited, or ceased. These shall include during the time of the project, but not be limited to:

1. No work after 6:00 p.m. on six (6) weekday evenings for back-to-school, open house, and other events per school year at each school site.

2. No work between 8:00 a.m. and 10:00 a.m. on five (5) student attendance weekdays for assembly events per school year.

3. NO NOISE/WORK will be allowed on an Elementary school site between 8:00 a.m. and 12:30 p.m. on twelve (12) student attendance weekdays for testing (four (4) consecutive weekdays, three times) per school year. Second shift work may be accommodated with the request pre-approved by the District Project Manager.

4. NO NOISE/WORK will be allowed on a Middle School or High School site between 8:00 a.m. and 1:30 p.m. on twenty (20) student attendance weekdays for testing (four (4) consecutive weekdays during the first semester; sixteen (16) consecutive weekdays during the second semester) per school year. Second shift work may be accommodated with the request pre-approved by the District Project Manager.

D. It shall be noted that there are students in the Early and Extended Education Learning Program in attendance on the Elementary school sites from 6:00 a.m. through 6:00 p.m. on a daily basis throughout the school year, and on each day that Classified Staff are assigned working hours (see specific EEELP calendar for each site, per each school year).

E. Work hours for the Project shall be from 7:00 a.m. until 10:00 p.m. Monday through Saturday, unless advance permission to deviate from these hours is obtained from the City of Glendale per Glendale Municipal Code, Title 8, Chapter 36, and this request is also approved in writing five working days beforehand by the District Project Manager.

F. Article 3 of the Bid General Conditions requires preparation of a Cost-loaded time logic schedule with a single critical path. If the Board approved lowest responsive and responsible bid Contractor and the Project Manager, on behalf of the District, cannot agree on the contract construction schedule and the project single critical path within fifteen (15) days after Notice to Proceed, the District may terminate the Contract, for convenience, as outlined in the Project General Conditions. In the event this is necessary, compensation to the General Contractor and all subcontractors or materialmen shall be limited to Mobilization costs only.

G. The liquidated damages shown in the Supplementary General Conditions shall apply to each phase of the phased construction plan, as defined by and within the plans and specifications.

H. No warranties or guarantees shall go into effect, for any trade, regardless of when completed in the sequence of the project erection, until one (1) day after the Board of Education has accepted the project at a noticed meeting. Attention: Bidders. This will require certain trades to bid for, and provide, a warranty of longer than one (1) year in length from the time of installation or furnishing of their materials to the project, depending upon the sequencing of their work within the overall schedule.

I. All project close-out/punchlist items, project record documents, submittals, and operations manuals and spare parts, warranties and guarantees and Contractor's Final Verified Report (DSA6) shall be reviewed and accepted prior to the Architect/District agreed upon authorization to file the Notice of Completion with the Los Angeles County Recorder.

J. In the event that any materials requiring DSA Inspection (steel, concrete, masonry grout, etc.) are manufactured in an area located more than one hundred miles (100 miles) by air radius from the project site, all round-trip travel and all per diem costs incurred by the District on behalf of the Deputy Inspector who must perform on-site examination of the materials shall be borne 100% by the Contractor as an added expense. This charge shall be subtracted from the monthly "Application for Payment" submitted to the District on behalf of the project.

K. In the event the General Contractor or any subcontractor or materialman (on or off site) voluntarily accelerates the schedule for their own purposes, and/or voluntarily performs work in excess of eight (8) hours per day, or on the weekends or holidays, the additional cost of the Inspectors' overtime premiums which are required to inspect the work during these hours shall be paid 100% by the Contractor. This charge shall also be subtracted from the monthly "Application for Payment" submitted to the District on behalf of the project.

L. In the event that the Contractor fails to complete all punch list items and turn over all "deliverables, warranties, As-builts, etc." within sixty (60) days after acceptance of completion by the Board of Education, the full salary costs of one (1) construction Project Manager (16 hours per week @ $120.00/hour) and one DSA Inspector of record (actual hours spent @$80.00/hour) shall be backcharged to the Contractor, in addition to the liquidated damages, if any, imposed upon the Contractor for late performance. THIS PARAGRAPH WILL BE STRICTLY ENFORCED.

M. The submission of complete project record documents, as required by the specifications, is critical. A value of Thirty Thousand Dollars ($250.00) shall be assigned to these record documents within the Schedule of Values and will not be paid or released until the documents are approved by the Architect and turned over to the District's Administrator of Planning, Development and Facilities.

M. The intent of these contract documents is that the work of alteration, rehabilitation or construction is to be accordance with Title 24, California Code of Regulations. Should any existing conditions such as deterioration or non complying construction be discovered which is not covered by the Contract Documents wherein the finished work will not comply with Title 24, California Code of Regulations, a change order, or a separate set of plans and specifications, detailing and specifying the required repair work shall be submitted to and approved by DSA before proceeding with the repair work.

1.02 RELATED WORK BY DISTRICT:

A. General: All such work indicated in Contract Documents and/or specified herein.

B. Coordination:

1. Contractor shall schedule and coordinate Owner work with his work; give 5 days min. advance notice of all dates; verify that Owner work has been accomplished prior to beginning his work

C. Owner Furnished Items or Products (IF ANY):

1. Owner Responsibilities:

a. Delivery of items or products to site.

b. Schedule delivery date with supplier in accord with Contractor's schedule.

c. Obtain installation drawings and instructions.

d. Submit claims for transportation damages.

e. Arrange guarantees, warranties.

2. Contractor's Responsibilities:

a. Schedule required delivery date for each product, and inform Owner.

b. Promptly inspect delivered products, report damaged or defective items.

c. Unload; handle at site, including uncrating and storage.

d. Protect from exposure to elements, from damage.

e. Repair or replace items damaged as result of Contractor's operations.

f. Install, connect, finish products.

B. The Contractor shall provide adequate storage within his fenced staging area, to store the equipment. The Contractor is solely responsible for the storage of this equipment within his staging area and all subsequent movement of this equipment. The Contractor shall be solely responsible for the maintenance and protection of all material.

C. Bidders submitting under this Contract shall include the price for all necessary coordination with the District and the equipment manufacturer, as required for proper and complete coordination between all trades and all Contractors, within their bid.

1.05 WORK BY OTHERS

A. The District reserves the right to do other work in connection with the project or adjacent thereto by contract or otherwise, and Contractor shall at all times conduct the work so as to impose no hardship on District or others engaged in District's work nor to cause any unreasonably delay or hindrance thereto.

B. Where two or more Contractors are employed on related or adjacent work, each shall conduct their operation in such a manner as not to cause delay or additional expense to the other.

C. Contractor shall be responsible to others engaged in the related or adjacent work for all damage to work, to persons, or for loss by failure to finish the work within the specified time for completion. Contractor shall coordinate his work with the work of others so that no discrepancies shall result in the project.

PART 2 - PRODUCTS (NOT USED)
PART 3 - EXECUTION (NOT USED)

END OF

SECTION 01 11 25

PHASING OF THE WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Description *of* Phasing *of* work.

B. Requirements for utilities, heating system and air conditioning system in various phases.

1.02 RELATED SECTIONS

A. Section 011100: Summary *of the Project.*

1.03 PHASING OF THE WORK GENERAL

A. Project shall be constructed in separate increments in the specified sequence, including work described in phasing drawings and project manual.

B. During performance *of* work of this Contract, school will remain in session. Buildings will be occupied by students during regular school hours. Work at locations outside buildings will be permitted during school hours, provided that safe access to and exits from buildings are installed and/or maintained by contractor while school is in session and temporary barricades are erected around construction and work areas

C Work on buildings during regular school hours shall be limited to areas within a designated phase. However, work may be permitted in other areas when it cannot be done during its designated phase, upon approval of the District Inspector and Project Manager. Work shall not block legally required exits or corridors, shall not create hazardous conditions or excessive noise and shall not adversely affect operation of the school. Mechanical, Electrical or other work in classrooms and other occupied rooms shall be required to be performed before or after school hours.

D. Corridors and stairways necessary for exits and access in partially unoccupied buildings must remain accessible during school hours. Contractor shall install dust proof, temporary solid barricades separating Contractor's work areas from areas that must remain accessible.

1.04 Construction Phasing Plan (may be modified by Architect/Owner):

A. Project phasing shall be developed by the Contractor prior to start of construction and reviewed with the Architect and District to minimize student disturbance and maintain timely scheduled completion.

1.05. UTILITIES

A. Utilities serving occupied portions of a building including Heating, Air Conditioning, Plumbing, Signals and Electrical shall not be disconnected or interrupted during regular school hours. All existing utility interruptions shall be pre-approved in writing for temporary disconnect and re-energize by District Inspector/Project Manager a minimum of 72 hours in advance.

1.06 HEATING SYSTEM

A. Contractor shall provide temporary heating as required during work.. Heating system shall be operable in each phased area before occupancy of building in each separate phase.

1.07 AIR CONDITIONING SYSTEM

A. Air Conditioning systems shall be operable in each phased area before occupancy of building in each separate phase.

1.08 SPECIAL CLEAN-UP

A. When Contractor is required or otherwise arranges through the Project Inspector, to perform work in rooms or areas after regular classroom hours, and regular classes are conducted daily in these rooms or areas, the following cleaning shall be done upon completion of work each day:

1. Remove debris and unused materials

2. Remove dust by vacuum cleaning, mopping and dusting with wet mops and rags, and other means so as to leave the surfaces of desks, and other furniture, floors, walls and other surfaces dry and dust free.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Price and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 SCHEDULE OF VALUES

A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Project Architect for approval.

B. Forms filled out by hand will not be accepted.

C. Submit Schedule of Values in duplicate within 15 days after date established in Notice to Proceed.

D. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization and bonds and insurance.

E. Include in each line item, the amount of Allowances specified in this section.

F. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.

G. Revise schedule to list approved Change Orders, with each Application For Payment.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Form to be used shall be similar to: AIA G702 and Continuation Form G703.

C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Project Architect for approval.

D. Forms filled out by hand will not be accepted.

E. For each item, provide a column for listing each of the following:

1. Item Number.
2. Description of work.
3. Scheduled Values.
4. Previous Applications.
5. Work in Place under this Application.
6. Authorized Change Orders.
7. Total Completed to Date of Application.

8. Percentage of Completion.

9. Balance to Finish.

10. Retainage.

F. Execute certification by signature of authorized officer.

G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed.

H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.

I. Submit three copies of each Application for Payment.

J. Include the following with the application:

1. Transmittal letter as specified for Submittals in Section 01 30 00.

2. Construction progress schedule, revised and current as specified in Section 01 32 16.

3. Current construction photographs specified in Section 01 30 00.

4. Partial release of liens from major Subcontractors and vendors.

K. When Project Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.04 MODIFICATION PROCEDURES

A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to the Contract Documents.

B. For minor changes not involving an adjustment to the Contract Price or Contract Time, Project Architect will issue instructions directly to Contractor.

C. For other required changes, Project Architect will issue a document signed by Glendale Unified School District instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.

1. The document will describe the required changes and will designate method of determining any change in Contract Price or Contract Time.

2. Promptly execute the change.

D. For changes for which advance pricing is desired, Project Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 15 calendar days.

E. Contractor may propose a change by submitting a request for change to Project Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 60 00.

F. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

1. For change requested by Project Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.

2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Project Architect.

3. For change ordered by Project Architect without a quotation from Contractor, the amount will be determined by Project Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

G. Substantiation of Costs: Provide full information required for evaluation.

1. On request, provide following data:

a. Quantities of products, labor, and equipment.

b. Taxes, insurance, and bonds.

c. Overhead and profit.

d. Justification for any change in Contract Time.

e. Credit for deletions from Contract, similarly documented.

2. Support each claim for additional costs with additional information:

a. Origin and date of claim.

b. Dates and times work was performed, and by whom.

c. Time records and wage rates paid.

d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

H. Execution of Change Orders: Project Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Price.

J. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

K. Promptly enter changes in Project Record Documents.

1.05 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Price, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:

1. All closeout procedures specified in Section 01 70 00.

PART 2 PRODUCTS- NOT USED

PART 3 EXECUTION- NOT USED

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Alternates: This Section identifies each Alternate by number, and describes the basic changes to be incorporated into the Work, when the specific Alternate is made a part of the Work.

1. Referenced sections of specifications stipulate pertinent requirements for products and methods to achieve the work stipulated under each alternate.

2. Coordinate pertinent related work and modify surrounding work as required to properly integrate the work under each Alternate, and to provide the complete construction required by Contract Documents.

B. Owner's Option: Incorporation of any Alternate into the Work is at Owner's option.

1.02 DESCRIPTION: BASE BID

A. All of the "In-Contract" work shown on Contract Documents, except for additive Alternates.

B. Contractor's overhead, profit, bond, taxes and required permit fees on above items.

1.03 ALTERNATE LIST:

Alternate #1 - Provide 5 ft. Chain Link Fence on both sides of the existing Fire Lane, maintain required lane width. Do not obstruct existing stairs handicap ramp leading to field, portables and play area. Provide double swing Gate between 3000 Classroom Building and Shade Structure, this gate should not swing open into Fire Lane.

1.04 CONTRACT CONSIDERATIONS:

A. Indicate prices for each alternate on Bid Form; if no change in price required, indicate no change.

B. Indicate on the bid form the amount to be added or deducted from the base bid, should the alternate be accepted.

C. Include in alternate price all miscellaneous materials, parts, accessories incidental to or required for a complete installation regardless of whether they are mentioned in the alternate description.

D. Voluntary alternates will not be considered in evaluation of bids.

E. The Owner reserves the right to accept any or all alternates in order or combination.

F. The Owner reserves the right to accept no alternates.

G. Accepted alternates will be identified in the Agreement.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 Alternates

A. Notify in writing each party involved of the status of each alternate, immediately after notification by the Owner's Project Manager.

B. Coordinate alternate work with related work and modify adjacent work as required.

END OF SECTION

SECTION 01 25 00

SUBSTITUTIONS AND PRODUCT OPTIONS

PART 1 - GENERAL

1.01 DESCRIPTION

A PRODUCT LIST:

1. Within ten (10) working days after date of Contract, submit to the Architect five (5) copies of complete lists of all products which are proposed substitutions and those proposed as "or equal:" to products specified, and in accordance with Contract documents.

2. For products specified only by reference standards, select any product meeting standards, by any manufacturer.

3. For products specified by naming several products or manufacturers, select any products and manufacturer named.

1.02 SUBSTITUTIONS

A. Requests for substitutions shall be made only in writing on the "SUBSTITUTIONS REQUEST" form attached with all blanks completed except those reserved for the Design Consultant. All substitution requests shall be made by the Contractor.

B. In connection with the use of any substitute item approved by the Architect it shall be the Contractor's responsibility to see that such items meet all space requirements, and that any alterations to connecting items necessitated by use of the alternate items are properly made, at no increase in cost to the District.

C. In making request for substitutions, Bidder/Contractor represents that:

1. He has investigated the proposed products or method and determined that it is equal or better in all respects to that specified and that it fully complies with all requirements of the Contract Documents.

2. He will meet all contract obligations with regards to this substitution;

3. He will coordinate installation of accepted substitutions into the work, making all such changes and any required schedule adjustments, at no additional cost to the District, as may be required for the work to be completed in all respects;

4. He waives all claims for additional costs and additional time related to substitutions which consequently become apparent. He also agrees to hold

the District and Architect harmless from claims for extra costs and time incurred by other subcontractors and suppliers, or additional services which may have to be performed by the Architect, for changes or extra work that may, at some time or date, be determined to be necessary in order for the work to function in the manner intended in the Contract Documents.

5. He shall provide the same warranty and guarantee, and perform any work required in accordance therewith, for the substitution that is applicable to the specified item for which the substitution is requested;

6. Material shall be installed , handled, store, adjusted, tested, and operated in accordance with the manufacturer's recommendation and as specified in the Contract Documents.

7. In all cases, new materials shall be used unless this provision is waived by written notice from the Architect or unless otherwise specified in the Contract Documents; and

8. All material and workmanship shall in every respect be in accordance with and in conformity with approved modern and accepted industry practices, and shall conform to all applicable codes, regulations, laws, ordinances, and Contract Documents.

1.03 DESIGN PROFESSIONAL OPTIONS

A. The Architect will be sole judge of acceptability of any proposed substitutions, and only approved substitutions that are accepted in writing may be used on contract work.

B. Each request for substitution approval shall include:

1. "Substitution Request" form with all required data completed, and accompanying specifications, etc., in triplicate.

2. Identity of product for which substitution is requested; include specifications page and paragraph number.

3. Identity of substitution; include complete product description, drawings, photographs, performance and test data, and any other information necessary for evaluation.

4. Quality and technical specification comparison of proposed substitution with specified products.

5. A description of changes required in other work because of substitution.

6. Effect on construction progress schedule.

7. Cost comparison of proposed substitution with specified product.

8. Any required license fees or royalties.

9. Availability of local maintenance service within a 50 mile air radius of the project.

10. Source of replacement material or spare parts; if necessary, within a 50 mile air radius of the project.

1.04 SUBSTITUTION REQUESTS DURING BIDDING PERIOD

No request for substitution approval will be considered unless written request in triplicate has been submitted on the "Substitution Request" form included herein, and has been received by the Architect at least ten (10) working days prior to bid opening date. The Architect will issue addenda prior to bid opening listing all approved substitutions, should there be any approved.

1.05 SUBSTITUTION REQUESTS AFTER CONTRACT AWARD

A. Approval will be granted only when:

1. Specified product cannot be delivered without project delay, or

2. Specified product has been discontinued, or,

3. Specified product has been replaced by superior product, or

4. Specified product cannot be guaranteed as specified, or

5. Specified product will not fit within designated space, or

6. Substitution otherwise determined by the District to be in its best interest.

B. The Contractor's request for substitution shall be accompanied by evidence documenting the reason for the substitution falls within one or more of the cases listed in A1 through A6 above.

C. A Change Order authorizing substitutions and revising Contract Sum where appropriate will be issued for approved substitutions.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

SUBSTITUTION REQUEST (in triplicate)

TO:_____

PROJECT:_____

SPECIFIED ITEM:

_____

SECTION PAGE PARAGRAPH DESCRIPTION

The undersigned requests consideration for the following:

PROPOSED SUBSTITUTION: _____

_____

STATE THE REASON(S) FOR PROPOSED SUBSTITUTION: (REASON MUST CONFORM TO ONE OR MORE CASES LISTED IN PARAGRAPH 1.05 A1 THROUGH 1.0A6.)

_____

_____

_____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request and applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents which the proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments are correct:

1. The proposed substitution does not affect dimensions shown on drawings:
2 The undersigned will pay for changes to the building design, including Architect's and engineering design, detailing, and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule or specified warranty requirements.
4. Maintenance and service parts will be locally available (<50 miles from project) for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by:

Signature:_____

Firm: _____

Address: _____

_____

Date: _____

Telephone:_____

For use by the Architect:

☐ Accepted ☐ Accepted as noted

☐ Not Accepted ☐ Received too late

By: _____

Date: _____

Remarks: _____

_____

Attachments: _____

_____

SECTION 01 31 13

PROJECT COORDINATION

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Coordination of Work of Contract.

1.02 RELATED REQUIREMENTS

A. General Conditions

B. Section 017329 — Cutting and Patching

D. Section 013119 — Project Meetings

E. Section 013300 — Shop Drawings, Product Data and Samples

F. Section 012513 — Substitutions and Product Options

G. Section 017700 — Contract Closeout

1.03 SUBMITTALS

A. Coordination Drawings: Submit in accordance with Section 01340, as specified herein.

B. Work Plans: Submit as specified herein.

1.04 DESCRIPTION

A. Coordinate scheduling, work activities, submittals, including deferred approvals, District separate contracts and work of the various sections of Specifications in accordance with the Master Project Schedule.

B. Coordinate sequence of Work to accommodate District's separate contract and District's Occupancy as specified in Section 011100.

C. Set up control procedures so that the Master Project Schedule is adhered. Contractor's responsibility is to properly notify District's Project Manager of anticipated and actual time delays. Refer to General Conditions.

D. Coordinate the Work and do not delegate responsibility for coordination to any Subcontractor.

E. Anticipate the interrelationship of all Subcontractors, District separate contracts, and their relationship with the Work

F. Resolve differences or disputes between Subcontractors concerning coordination, OR interference of Work between SECTIONS.

1.05 NOT USED

1.06 NOT USED

1.07 COORDINATION

A. General: Work of the Contract includes coordination of the entire work of the Project, from beginning of construction activity through Project close-out and warranty periods.

B. Mechanical/Electrical Requirements of General Work: Comply with applicable requirements of Division 23 Sections for Mechanical Provisions within units of General Work, and comply with applicable requirements of Division 26 for Electrical provisions within units of General Work.

C. Service Connections: Except as otherwise indicated, final connection of mechanical services to general work is defined as being mechanical work, and final connection of electrical services to general work is defined as electrical work.

D. Coordination: The Project will require close cooperation and coordination with the school site administration, the Architectural team, District Project Manager, and Contractor and Subcontractors. The Contractor shall consider all such coordination in his work inclusive, but not limited to, scheduling and proper sequencing of the Work with subcontractors and the District school site calendar and times that work cannot be, or occupied areas of the project school site that cannot be undertaken, during the entire project. In particular, the coordination of work before District's substantial completion of each project phase, and ensuring the site administration, the Architectural team, Inspector, and District Project Manager are fully advised of his activities to complete the Work in accordance with the Master Project Schedule.

E. Coordination/Engineering Drawings:

1. Contractor shall prepare and submit complete 1/4 " = 1'0" coordination drawings, Including plans, sections, details, etc., indicating the complete layout and all mechanical and electrical materials and equipment in all areas and within the ceiling spaces for new and existing conditions, including bottom of duct, pipe, conduit and elevations to allow District Architectural team to review with other Prime Trade Contractors' work that Contractor ensures will be coordinated properly.

2. Mechanical, plumbing and electrical Prime Trade Contractors shall be responsible for providing all vertical sections through floors showing structural physical restraints, architectural restraints, plenum spaces and all other physical obstructions that may affect work.

3. Electronic reproduction or photo reproduction of the project's Architectural, Structural, or MEP drawings will not be acceptable.

G. Mechanical, plumbing and electrical Prime Trade Contractors shall prepare a 1/4" sleeving layout indicating size and location of sleeves. Provide copies to applicable trades and District Architectural team.

H. Coordination/Engineering Drawings: These drawings are for the Contractor's and District's Representative's use during construction and shall not be construed as replacing any shop drawings, "as-built", or Record Drawings required elsewhere in these Contract Documents.

I. Debris Removal and Material Access: An area will be designated for debris removal and material access as agreed by the Contractor and Architectural team at the school site.

1.08 EQUIPMENT COORDINATION

A. Equipment Coordination: With respect to mechanical and electrical features of Contractor

and/or District supplied equipment, complete data must be exchanged directly between the Contractor and those vendors and subcontractors involved as the progress of the Project requires. The person requesting the information shall advise when it will be required.

B. The Prime Trade Contractor's for casework and equipment are expressly required to provide large scale layout drawings for casework and equipment showing the required rough-in locations of all services (dimensioned from building features) service characteristics, and locations of studs where the location is critical to mounting or otherwise installing equipment and casework. Furnish sizes and spacing required for Mechanical and Electrical cutouts, and a complete brochure of fittings, sinks, outlets, or other information to provide complete data on the items and accessories being furnished.

C. In the event of incorrect, incomplete, delayed or improperly identified information, the entity causing the delay or error shall be responsible and pay for any modifications or replacements necessary to provide a correct, proper and new installation, including relocations required.

1.09 MEETINGS

A. In addition to progress meetings specified in Section 013119, attend coordination meetings and pre-installation conferences with requisite personnel to assure coordination of Work when scheduled with the Architectural, Engineer, Inspector, or Project Manager.

1.10 COORDINATION OF SUBMITTALS

A. Schedule and coordinate submittals as required and as specified in Section 013300.

B. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such materials and equipment.

C. Coordinate requests for substitutions to assure compatibility of space, of operating elements, and effect on work of other sections.

D. Prime Trade Contractors shall submit the following drawings for review and approval:

1. Fire Protection Drawings: Refer to Division 21.

2. Fire Alarm System: Refer to Division 26.

1.11 COORDINATION OF SPACE

A. Mechanical, plumbing and electrical Prime Trade Contractors shall coordinate use of Project space and sequence of installation of mechanical, and electrical work which is indicated diagrammatically on Drawings. Follow routings shown for pipes, ducts, and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

B. In finished areas, except as otherwise shown, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

C. Off-Site Fabrication: Off-site fabrication is encouraged as much as possible and deliveries scheduled so materials and equipment can be installed immediately after delivery. The Contractors shall alert and advise materialmen of the need to hold deliveries until they are notified the materials are required on the site.

1.12 ELECTRICAL COORDINATION

A. Provide supervision, communications, and coordination necessary to meet the requirements of electrical power connection as set forth by the designated power company (e.g. Glendale Water and Power; SoCal Edison).

B. Provide reasonable and convenient staging and access areas near buildings to permit the respective Utility or its vendors or subcontractors, to install, modify or remove equipment and other components of the electrical power system furnished and installed by the designated power company.

1.13 COORDINATION OF CONTRACT CLOSEOUT

A. Coordinate completion and cleanup of work of separate sections in preparation of District school site occupancy with approval of final cleanup by the Inspector and Project Manager.

B. After District occupancy of premises, coordinate access to site by various sections for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of District/school activities.

C. Assemble and coordinate closeout submittals specified in Section 017700.

1.14 NOT USED

1.15 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. The Drawings show, if applicable, existing above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, hot water, and other utilities which are known to the District.

B. Locate all known existing installations before proceeding with construction operations which may cause damage to such installations. Existing installations shall be kept in service where possible and damage to them shall be repaired with no adjustment of Contract Sum. District archives as-built drawings, and Contractor shall be responsible to request to view any and all drawings for the areas that may be affected in the construction before the work begins.

C. If any unforseen structures or utilities are encountered, request District's Architectural Team to provide direction on how to proceed with the Work.

D. If any structure or utility is damaged, take appropriate action to ensure the safety of persons and property and report the same to the District's Architectural Team, and begin immediate remediation of any safety-related condition.

PART 2 — PRODUCTS - NOT USED.

PART 3 — EXECUTION - NOT USED

SECTION 01 31 19

PROJECT MEETINGS

PART 1-GENERAL

1.01 SUMMARY

A. Work Included in this Section:

1. The Contractor's participation in preconstruction conference, application for payment, and guarantees, bonds, service and maintenance contracts review meetings.

2. The Contractor's administration and participation in project weekly progress meetings, pre-installation conferences and other meetings, as necessary.

1.02 PRE-CONSTRUCTION CONFERENCE

A. Prior to commencement of Work, attend a pre-construction conference at time and a place selected by the School District to discuss procedures to be followed during the course of the work.

B. The purpose of the conference is to introduce the Balboa Elementary School Fence Project with the Architectural Team, the Inspector, the Construction/Project Managers, and the School's Representative key personnel, to review the contract provisions, project procedures, and other items pertaining to the Project; distribute documents including sample forms referenced in the Contract Documents; answer any questions related to construction contract administration; and establish schedule and procedures for future meetings. (This meeting is NOT to discuss any construction related specific specifications and drawings, nor address any requests for substitutions, etc.)

C. Attending shall be:

1. District Representatives from Facilities Planning, Development and Support Operations, and/or the Business Office.

2. School Site Representatives, including the Construction Liaison

3. The Project Inspector of Record

4. The Architect of Record, and Architect's Construction Architect

5. The Engineering Consultants

6. The Contractor's Contracts Representative/Project Manager

7. The Contractor's on Site Representative/Superintendent

8. Representatives of the major subcontractors, as necessary

1.03 CONSTRUCTION PROGRESS MEETINGS

A. During the course of construction, progress meetings will be held to discuss and resolve field problems.

B. Meeting Schedule: At maximum one-week intervals or more often when required by the Architect/Inspector and/or Project Manager.

C. Meeting Location: As designated by the District's Project Manager, in conjunction with the School Site liaison.

D. Attending shall be:

1. The District's Representative from Facilities Planning, Development and Support Operations, and/or the Business Office

2. The Project Inspector of Record

3. The Architect's Construction Architect

4. The Engineering Consultants as appropriate to the Meeting Minute format, and as agreed upon by the Contractor and the Project Manager beforehand

5. The Contractor's On-Site Superintendent

6. The Contractor's Representative/Project Manager

7. Representatives of subcontractors/major suppliers as appropriate to a specific item of the Meeting Minute format, and at the time the specific item is reflected on the Meeting Minutes.

8. Others as appropriate to the Meeting Minute format and as agreed upon by the Contractor and the Project Manager beforehand.

NOTE: Representatives of the Contractor, subcontractors and suppliers attending Construction Progress Meetings shall be qualified and authorized to act on behalf of the entity each represents.

F. Suggested Agenda:

1. Review of work progress since previous meeting.

2. Review of upcoming work to take place in project schedule.

3. Discuss School Site concerns with regard to safety, paths of travel, and any upcoming events that may affect the work schedule. Dismiss School Site liaison.

4. Review and approve Minutes of previous meeting.

   Discuss field observations, problems, and decisions, affecting the work.

5. Review submittals schedule and status of submittals.

6. Review status of proposed substitutions, if any.

7. Review RFI's, PCO's, and Change Orders, if any.

8. Review off-site fabrication and delivery schedules.

9. Review maintenance of progress schedule.

10. Agree on corrective measures to regain projected schedules, as necessary.

11. Review planned progress during succeeding work period.

12. Review coordination of projected progress.

13. Review maintenance of quality and work standards.

14. Review project safety of workers and practices.

15. Review any Inspector of Record Field Notices, or Deviations logs.

16. Other items relating to the Work.

G. The Architect, in coordination with the Project Manager, will make physical arrangements for project meetings, and the Architect shall prepare agenda, preside at meetings, record minutes, and distribute electronic draft copies of Minutes within three working days after Construction Project Meetings to the Project Manager, Inspector, conference participants and those affected by the decisions made at the conference. The Architect will record in the minutes significant discussions and agreements and disagreements.

1.04 PRE-INSTALLATION CONFERENCES

A. The Architect/Inspector may conduct a pre-installation conference at the site before each construction activity that the Architect/Inspector deems requires coordination with other construction or when required by the Construction documents.

B. Attendance will be required of parties directly affecting, or affected by, or involved in the installation, and its coordination or integration with other materials and installations that have preceded or will follow the particular item of work or activity under consideration. Parties attending the conference shall be qualified and authorized to act on behalf of entity each represents.

C. Conference Schedule: Schedule conference to assure a sufficient amount of time prior to the scheduled work or activity under consideration so that any concerns, problems or disagreements can be resolved without delaying the Project.

D. The Architect, on conjunction with the Inspector, will make physical arrangements for conferences, prepare the agenda, preside at conferences, record minutes, and distribute copies within two working days after a conference to the Project Manager, Inspector, conference participants and those affected by the decisions made at the conference. The Architect will record in the progress meeting minutes significant discussions and agreements and disagreements as takes place in pre-installation conferences.

E. Suggested Agenda: Review the progress of other construction activities and preparations for the particular activity under consideration, including requirements for:

1. Contract Documents
2. Options
3. Related Change Orders
4. Purchases
5. Deliveries
6. Shop Drawings, Product Data and quality control Samples
7. Possible conflicts
8. Compatibility problems
9. Time Schedules
10. Weather limitations

11. Manufacturer's recommendations

12. Compatibility of materials

13. Acceptability of substrates

14. Temporary facilities

15. Space and access limitations

16. Governing regulations

17. Safety

18. Inspection and testing requirements

19. Required performance results

20. Recording requirements

21. Protection

F. Do not proceed with the work or activity if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of work and reconvene the conference at the earliest feasible date.

1.05 OTHER REQUIRED MEETINGS

A. Project Closeout Meeting:

1. Thirty (30) days prior to the estimated substantial completion the project/phase, the Architect, Inspector, and Project will coordinate a meeting to review required construction maintenance manuals, guarantees, closeout submittals, bonds, and service contracts for materials and equipment; review and implement repair and replacement of defective items, and extend service and maintenance contracts, and schedule site training for all equipment.

2. Attending shall be:

a. The District's Representative of Facilities Planning, Development and Support Operations, and/or Business Office

b. The Project Inspector

c. The Construction/Project Manager

d. The Engineering Consultants, as appropriate

e. The Contractor's on-site Superintendent

f. Subcontractors, as appropriate

g. Suppliers, as appropriate

h. Others, as appropriate

B. Guarantees, Bonds, and Service and Maintenance Review Meeting:

1. Eleven months following the date of Substantial Completion, the District Project Manager will convene a meeting for the purpose of reviewing the guarantees, bonds, and service and maintenance contracts for materials and equipment.

2. Attending shall be:

a. The District's Representative

b. The Architect

c. The Engineering Consultants, as appropriate

d. The Contractor's Representative

e. Subcontractors and Suppliers, only as appropriate

f. Others as appropriate

1.06 PRIME TRADE CONTRACTOR MEETINGS

A. Construction Progress Meetings:

1. To be held at maximum one-week intervals or more often when required by the Architect/Inspector/Construction Project Manager.

2. Meeting Location: Contractor Jobsite trailer

3. All Prime Trade Contractors shall attend in order to review progress of work, and submit any questions or requests to the Contractor in order to ensure coordination of installations during the work schedule.

END OF SECTION

SECTION 01 31 43

REQUEST FOR INFORMATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures to be followed by Contractor upon discovery of any apparent conflicts, omissions, or errors in Contract Documents or upon having any question concerning interpretation.

1.02 PROCEDURES

A. Notification by Contractor:

1. Submit all requests for clarification and additional information in writing to Project Architect using the Request for Information (RFI) form provided by Project Architect or a similar form approved by Project Architect.

2. RFI received directly from a subcontractor will be returned unprocessed to the Contractor.

3. Number RFIs sequentially. Follow RFI number with sequential alphabetical suffix as necessary for each resubmission. For example, the first RFI would be "001". The second RFI would be "002". The first resubmittal of RFI "002" would be "002a".

4. Limit each RFI to one issue on one subject and to no more than five questions.

5. Submit RFIs if one of the following conditions occur:

a. Contractor discovers an unforeseen condition or circumstance that is not described in the Contract Documents.

b. Contractor discovers an apparent conflict or discrepancy between portions of the Contract Documents that appears to be inconsistent or is not reasonably inferred from the intent of the Contract Documents.

c. Contractor discovers what appears to be an omission from the Contract Documents that cannot be reasonably inferred from the intent of the Contract Documents.

d. RFIs will not be recognized or accepted if, in the opinion of Project Architect, one of the following conditions exist:
   1) Contractor submits the RFI as a request for substitution.
   2) Contractor submits the RFI as a submittal.
   3) Contractor submits the RFI under the pretense of a Contract Documents discrepancy or omission without thorough review of the Documents.
   4) Contractor submits the RFI in a manner that suggest that specific portions of the Contract Documents are assumed to be excluded or by taking an isolated portion of the Contract Documents in part rather than whole.
   5) Contractor submits an RFI in an untimely manner without proper coordination and scheduling of work or related trades.
   6) Contractor submits and RFI that does not conform to Paragraph 1.02.A.4.

e. Ask for any clarification or request for information immediately upon discovery. Submit RFIs in a reasonable time frame so as not to affect the project schedule while allowing the full response time described below.

f. RFIs shall carry the following information:
   1) Applicable specification section, article, and paragraph numbers.

2) Drawing number and detail references asneeded.

B. Response Time:

1. Project Architect, whose decision will be final and conclusive, shall resolve such questions and issue instructions to Contractor within a reasonable time frame. In most cases, RFis will receive a response within 7 calendar days. In some cases this time may need to be lengthened for complex issues, or shortened for emergency situations, as mutually agreed by all parties.

2. Should Contractor proceed with the work affected before receipt of a response from Project Architect, within the response time described above, any portion of the work which is not done in accordance with Project Architect's interpretations, clarifications, instructions, or decisions is subject to removal or replacement and Contractor shall be responsible for all resultant losses.

3. Additional Detailed Instructions:

a. Project Architect may furnish additional detailed, written instructions to further explain the work and such instructions shall be a part of Contract Documents. Should additional detailed instructions in the opinion of Contractor constitute work in excess of the scope of Contract, Contractor shall submit written notification thereof to Project Architect within seven calendar days following receipt of such instruction, and in any event prior to the commencement of work thereon. Project Architect will then consider such notice and if Project Architect considered it justified, Project Architect's instructions will be revised, or an extra work authorization will be issued.

b. Contractor has no claim for additional compensation or extension of the schedule because of any such additional instructions unless Contractor gives Project Architect written notice thereof within the time frame as specified above.

C. Prepare and maintain an RFIlog. Update on a weekly basis. Log RFI number, brief description of content or subject discussed, date submitted, and date answered. Keep log current and furnish copy when so requested by the Project Architect.; when records are kept on line, keep RFIlog accessible to all concerned.

D. Failure to Agree: In the event of failure to agree as to the scope of Contract requirements, Contractor shall follow procedures set forth in the disputes clause.

PART2PRODUCTS-NOTUSED.

PART 3 EXECUTION- NOT

USED.

END OF
SECTION

SECTION 01 33 13

SUBMITTAL PROCEDURES

PART1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for submitting the following types of submittals.

1. Shop Drawings.
2. Product Data.
3. Samples.
4. Calculations.
5. Certificates of Compliance.
6. Manufacturer's Instructions.
7. Deferred Approval.
8. HPI submittals.

B. Related Work Not Included in this Section:

1. Specific section reference requiring submittal. Make submittals only where specifically required.
2. Requirements of other types of submittals including but not necessarily limited to, test reports, operating instructions, maintenance data, and maintenance materials.
3. Specific requirement for Commissioning Submittals, See the Commissioning Section in Division One for requirments.

1.02 GENERAL REQUIREMENTS

A Submittals, except for deferred approvals, are not Contract Documents and do not become Contract Documents by virtue of their submission, review, and stamping by Project Architect.

1.03 SUBMISSION REQUIREMENTS

A Make submittal promptly in accordance with the Submittal Schedule and in such sequence as to cause no delay in the Work or in the work of any separate contractor.

B. Make submittals to Project Architect or to an individual designated by Project Architect.

C. Contractor's failure to indicate approval on submittal prior to submission to Project Architect will result in their being returned to Contractor without being acted upon.

D. No delays in construction occasioned by Contractor's failure to submit material for approval in accordance with the Submittal Schedule will be excused.

E. Package each submittal appropriately for transmittal and handling.

F. Number and type of copies to be submitted, distributed, and returned will be as stated herein, unless otherwise specified in technical Specification Sections.

G. Submittal of information not required as a submittal, or covering work for which the submittal has been returned as "approved" or "approved as noted", will be returned without review.

H. Approval of a separate material, product, or component does not imply approval of assembly

in which the item functions.

I. Incomplete submittals will be returned without review.

J. Submittal received from sources other than Contractor will be returned without action.

K. Submit complete submittals for each portion of the work; submit components of the work interrelated as a system at the same time.

L. When submittal acceptability is dependent on conditions, items, or materials included in separate subsequent submittals, the submittal will be returned without review.

M. Transmittal:

1. Transmit each submittal with Project Architect accepted form containing the following information.

   a. Submittal number.

   b. Submittal date.

   c. Project name.

   d. Project Architect's Project Number.

   e. Project Architect's name.

   f. Contractor's name.

   g. Subcontractor's name and address.

   h. Applicable Specification Section, Article, and Paragraph number.

   i. Drawing number and detail references, as appropriate.

   j. Quantity and type of submittals.

   k. Listing of documents and components that comprise the submittal.

   l. Date submittal is requested back from Project Architect.

   m. Distribution record (for both transmittal and submittals).

   n. Notice of any deviations from the Contract Documents contained in the submittal. Supply on separate sheets of Contractor's letterhead.

   o. Contractor's certification that the information complies with Contract Document requirements.

   p. Signature of transmitter.

   q. Any other pertinent information, including HPI material buy-out forms and back-up documentation for HPI related materials.

   r. Sequentially number transmittal forms. Mark revised or resubmitted submittals with original number and sequential alphabetic suffix.

   s. Incomplete transmittal forms are unacceptable and the entire submittal will be returned to Contractor without review at Project Architect's discretion.

N. Submittal Identification: Place a permanent label or title block on each document or component of each submittal for identification. Mark each copy of each submittal identically. Include the following information in label or title block.

1. Submittal/transmittal number.
2. Project name.
3. Project number.
4. Contractor's name.
5. Subcontractor's name.
6. Completely identify Samples with manufacturer's name and model number, material name and source, or similar information.
7. Provide space for Contractor's and Project Architect's review stamps.

0. Resubmittals:

1. If a submittal is returned for correction or is not satisfactory and is disapproved by Project Architect, resubmit the corrected material in the same quantity, including reproducibles, as specified for the original submittals.
2. Make resubmittal within 14 calendar days after receipt by Contractor of the disapproved material.
3. If the same document is used for resubmittal, clear identify revised portions of the document by clouding.
4. Keep each resubmittal intact and do not add new drawings, materials, or information outside the scope of the original submittal, except to answer Project Architect's comments.

1.04 CONTRACTOR'S RESPONSIBILITIES

A. It shall be the responsibility of Contractor to obtain Project Architect's approval of required submittals prior to initiating work represented. It is imperative that Contractor allow a minimum of fifteen (15) calendar days for submittals that require the review of Architect and Engineer(s) of Record.

B. Maintain a log of submittals showing the submittal number, the name of the Subcontractor making the submittal (where applicable), date submitted, date received, and action by Project Architect. Submit current copy of submittal log each month with Application for Payment.

C. Provide the following where applicable:

1. Field measurements.
2. Field construction criteria.
3. Catalog numbers and similar data.
4. Relation to adjacent structure or materials.
5. Field dimensions, clearly identified as such.
6. Notes identifying deviations from the Contract documents.

D. Prior to sending submittals to Project Architect, Contractor is to review them for:

1. Submittal completeness and accuracy including dimensions.
2. Compliance with requirements of Contract Documents.
3. Compatibility with other submittals, shop drawings, substitutions and work of other trades.
4. Coordination with existing job conditions.

5. Field verification of dimensions.

E. Apply Contractor's stamp to each document and component of each submittal certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of Work and Contract Documents.

1. Stamp all drawings with submittal number.
2. Contractor to wet sign first page of bound sets including shop drawings.
3. The person signing the stamp shall be one designated in writing by Contractor as having that authority.
4. Signature shall be in original ink. Stamped signature is not acceptable.

F. Notify Project Architect in writing, at the time of submission, of deviations in submittals from the requirements of the Contract Documents.

1. Contractor's responsibility for deviations in submittals shall not be relieved by Project Architect's review of the submittals, unless Project Architect gives written acceptance of specific deviations clearly identified by Contractor by clouding and the words "CONTRACT DEVIATION" and "SUBSTITUTION" in bold face print.
2. When submittal is revised for resubmission, identify changes made since previous submittal.

G. Contractor's responsibility for errors and omissions in the submittals shall not be relieved by Project Architect's review.

H. Be responsible for the accuracy of the submittals and for the proper fitting, verification of dimension, construction of the work, furnishing of materials, and work required by the Contract Documents but not indicated on the submittals.

I. Submission of Shop Drawings, Product Data, Calculations, or other submittals in either original submission or when resubmitted with corrections, constitutes evidence that Contractor has checked all information, thereon, and that it accepts and is willing to perform the work as shown, in a workmanlike manner, and in accordance with the best standard practice.

J. Do not submit Shop Drawings, Product Data, or Samples for products that have not been specified unless such products have been formally reviewed as a substitute in accordance with Section 01 60 00- Product Requirements.

K. Do not allow copies of submittals without Project Architect's stamp indicating reviewed by Project Architect to be used in connection with the Work. Do not permit submittals marked "Rejected" or "Revise and Resubmit" to be used at the Project site, or elsewhere where work is in progress.

L. Do not proceed with fabrication or installation of materials, products or systems until final approved submittals are in the possession of the fabricator or installer as appropriate.

M. Prepare and distribute additional sets of reviewed submittals to subcontractors, manufacturers, fabricators, suppliers, erectors, installers, and others as required for performance of the Work. Instruct parties to promptly report inability to comply with requirements.

N. Maintain one set of each submittal at the project site, available for reference.

O. Maintain one set of reviewed submittals for Record Documents as described in Section 01

78 00 – Closeout Submittals.

1.05 ARCHITECT'S RESPONSIBILITIES

A. Project Architect will review submittals with reasonable promptness and in accordance with the Submittal Schedule.

B. Project Architect will only review submittals for general conformance to the design concept and Contract Documents.

C. Do not construe Project Architect's review of relieving Contractor of its responsibility for:

1. Errors in details, dimensions or quantities.

2. Departures from additional details or instructions previously furnished by Project Architect.

3. Integrating and coordinating various trades and separate contracts.

4. Any violation indicated on such submittals, of State, or Federal laws, rules, ordinances, or rules and regulations of commissions, boards, or other authorities or public utilities having jurisdiction.

5. Quantity, fit, and dimensions.

6. Full compliance with the Contract Documents.

D. Project Architect shall reject the following submittals:

1. Which do not show evidence of being reviewed and approved by Contractor.

2. Which are incomplete or lack sufficient information.

3. Which are for products or materials that have not been specified unless such products and materials have been formally reviewed as substitutes in accordance with Substitution Section.

4. Withhold action on a submittal requiring coordination with other submittals until related submittals are received.

5. Return without reviewing submittals with multiple items and no clear indication as to which item is to be used in the Work.

6. Resubmittals that do not clearly indicate where revisions have been made to the provisions submittal.

E. Return without reviewing submittals with multiple items and no clear indication as to which item is to be used in the Work.

F. Project Architect will withhold action on a submittal requiring coordination with other submittals until related submittals are received.

G. Project Architect's review is only for items to be furnished by the submitting subcontractor or supplier and does not constitute approval of any assemblage of which the submitted item is a component or approval of construction sequence or method.

H. Project Architect will return without actions submittals not requested or required by Contract Documents or Project Architect.

I. Architect's Actions:

1. Where action and return is required, Project Architect will review Contractor's submittals, apply Project Architect's action stamp and indicate action, sign, and date.

2. The terms of Project Architect's action stamp have the following meaning:

   a. "REVIEWED" -- indicates that Project Architect takes no specific exception to the information contained in the submittal; Contractor may proceed with that portion of the Work described in the submittal -- subject to compliance with all applicable requirements of the Contract Documents.

   b. "REVIEWED AS NOTED"-- indicates that Project Architect approves the submittal for general design conformance with the specific exceptions noted; Contractor may proceed with that portion of the Work provided that the notations made by Project Architect are incorporated in the work-- and subject to compliance with all applicable requirements of the Contract Documents.

   c. "REVISE AND RESUBMIT"-- indicates that Project Architect has noted nonconforming work on the submittal, and/or desires clarification on some aspects of the submittal; the Contractor must make revisions and resubmit. Contractor may not proceed with the work described in the submittal.

   d. "REJECTED"-- indicates that Project Architect believes the submittal contains significant error or non conformance and is, therefore, rejected. A new submittal is required. Contractor may not proceed with that portion of the Work described by the submittal.

   e. Where a submittal does not require Project Architect's action, the submittal will be returned, marked "Action Not Required" or "Not Reviewed".

J. Project Architect will retain one copy of each submittal for Project Architect's file and one copy for each major consultant who has reviewed the submittal, unless otherwise noted.

K. When appropriate Project Architect will return submittals to Contractor for distribution, or for resubmission.

1.06 SUBMITTALS

A. Shop Drawings:

1. Shop Drawings facilitate integration, coordination, and progress of the Work.

2. Shop Drawings include fabrication, erection, and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings.

3. Shop Drawings include specially-prepared technical data for this Project, including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form for general application to a range of similar projects. Shop Drawings shall be prepared by Contractor or through Contractor by way of a subcontractor, manufacturer, supplier, distributor, or other lower tier contractor, to illustrate a portion of the work.

4. Submit shop drawings when specified and to illustrate every custom fabricated item or assembly.

5. Preparation:

   a. Provide newly prepared information with graphic information at accurate scale, except as otherwise noted. Do not reproduce Contract Documents and do not copy standard information as basis of Shop Drawings. Standard information prepared without specific reference to the project is not considered Shop Drawings.

   b. Contractor may request electronic files versions of specific drawings from

Project Architect to assist in the preparation of Shop Drawings. The Contract is to remove the Title Block including all references to Project Architect and their consultants. Contractor will be liable for information contained on Shop Drawings developed using electronic files provided by Project Architect. The format of electronic files will be AUTOCAD drawings

c. Include plans, sections, and details complete with information for making connections with other work and any other information necessary to adequately describe the unit of Work.

d. Identify materials, products, and finishes and, where applicable, use specification section numbers as reference.

e. Identify details by reference to Contract Drawings drawing and detail, schedule, or room numbers shown or specified.

f. Use same equipment, fixture, or item reference used in the Contract Documents.

g. Identify applicable standards.

h. Identify coordination requirements.

i. Dimension drawings, except diagrams and schematic drawings, and indicate which are based on field measurement. Prepare dimensioned drawings to scale..

j. Identify deviations from the Contract Documents by clouding and the words "CONTRACT DEVIATION" in boldface type or lettering.

k. Shop Drawings shall be not less than 8-1/2 by 11 inches or more than 30 by 42 inches, unless approved in advance by Project Architect.

l. Where coordination requirements necessitate scope of Shop Drawing to include more than one item, label Shop Drawing with specification section number of dominant trade involved. "Dominant" shall be defined as greatest quantity, greatest cost, or principal detail subject of drawing, whichever may be appropriate.

m. Draw Shop Drawings at large scale, fully detailed and with all materials and stock or purchased components fully identified.

n. Submission:
   1} For Shop Drawings presented on sheets larger than 11 inches by 17 inches, submit three opaque reproductions of each required shop drawing prepared for this project. Shop drawings can be no larger than 30 x 42 inches without prior of approval of Project Architect.
      (a} Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to the information required in the paragraph entitled "Submittals Identification".
      (b} Each drawing shall have clear space of approximately 4 by 10 inches to receive review stamps.
      (c) One copy of reviewed Shop Drawings will be returned to Contractor.
   2} For shop drawings presented on sheets 11 inches by 17 inches or less, conform to the format and quantity requirements for Product Data.

B. Coordination Drawings:

1. Prepare separate composite, detailed coordination drawings consisting of plans, elevations, and sections as required to clearly delineate and show relationship between utilities, mechanical, and electrical work.

2. Include and show due consideration for utilities, architectural elements, and structural elements (including excavations and shoring, utility vaults, manholes, and foundations for permanent and temporary construction) and identify potential interface trouble spots.

3. Individual drawings for single element will not be accepted or reviewed unless and until coordination drawings have been previously reviewed and accepted.

4. Purpose for coordination drawings is to determine, for mutual benefit of all concerned, precedence of trade work and allocation of available physical space for installation of trade work.

5. Coordination drawings are not to be construed to be shop drawings or as a replacement for shop drawings.

6. Generate and submit coordination drawings in timely manner and in support of Contract Schedule.

C. Product Data:

1. Product Data includes standard preprinted information on materials, products, equipment, and systems; not specially prepared for this Project, other than the designation of selections from among available choices printed therein.

2. Product Data permits Project Architect to determine which materials, products, and systems will be accepted in the project.

3. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings".

4. Preparation:

   a. Collect required data into one coordinated submittal for each unit of work, element of construction or system.

   b. Mark the manufacturer's brochures and catalog data to clearly indicate the items to be included as a part of the work. Product Data submitted with multiple items and no clear indication as to which item is to be used in the work will be returned to Contractor without being reviewed.

   c. Mark all submittals indicating item, options, and finishes proposed, and referencing technical Specification Section and paragraph covering the work in question.

   d. Use same equipment, fixture, or item reference used in the Contract Documents.

   e. Include the following as appropriate:
      1) Manufacturer's standard printed recommendations for application, installation and use. Supplement standard information to provide additional information applicable to the Project.
      2) Physical dimensions and clearances required. Indicate field dimensions that have been checked and verified.
      3) Performance characteristics, limitations and capacities.
      4) Structural, mechanical and electrical engineering information.
      5) Conformance with applicable standards, codes, fire ratings and acoustical ratings.
      6) Test data.
      7) Appearance characteristics.
      8) Samples of color and finishes.
      9) Identify coordination requirements.

10) Manufacturer's standard schematic drawings and diagrams:
    (a) Modify the drawings and other diagrams to delete information that is not applicable to the Work.
    (b) Supplement standard information to provide information specifically applicable to the Work.
11) Identify deviations from the Contract Documents by clouding and the words "CONTRACT DEVIATION" in bold face print.
12) Identify each document with information required in the paragraph entitled "Submittal Identification".
13) Statements such as "as specified" will not suffice.

f. Submittal:
    1) Submit six copies of Product Data.
    2) Heat transfer or other impermanent reproduction method or fading type of reproduction will not be accepted.
    3) Three copies of reviewed Product Data will be returned to Contractor.

D. Samples:

1. Samples include both fabricated and unfabricated physical examples of products, materials, products equipment, fixtures, devices, assemblies, or workmanship, physically identical to a portion of the Work, illustrating a portion of the Work or establishing standards for evaluating the appearance of the finished Work or both or (where indicated) for more detailed testing and analysis. Mock-ups are a special form of samples, which are too large or otherwise inconvenient for handling in specified manner for transmittal of sample submittals.

2. Review of Samples shall permit Project Architect to physically verify conformance of materials, products, fixtures, devices, assemblies, or workmanship with Contract Documents either by inspection or testing, and to select textures, colors, or other characteristics as stipulated in the Contract Documents.

    a. Review of Samples will be only for characteristics or uses named in such review and shall not be taken to change or modify any contract requirement except as specifically authorized or requested by Project Architect.

    b. Samples shall set standards for items or characteristics of which Samples are representative.

    c. After a sample has been accepted, no change in brand, manufacturer, or quality will be permitted unless satisfactory written evidence is presented to, and accepted by, Project Architect that the manufacturer cannot make scheduled delivery of the accepted material, or that the material delivered has been rejected and substitution of suitable materials is an urgent necessity.

    d. Refer to technical Specification Sections for additional requirements of samples, if any, which are intended for examinations or testing for other characteristics.

    e. Format and Quantity of Samples
        1) Furnish samples in the sizes below, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately the same size as specified:
            (a) Sample of equipment or device: Full size.
            (b) Sample of materials less than 2 by 3 inches: Attach to an 8-1/2 by 11 inch sheet.
            (c) Sample of materials exceeding 8-1/2 by 11 inches: Cut down to 8-1/2 by

11 inches as appropriate to indicate color, texture, and material variations unless directed by individual Section to submit larger size.

(d) Sample of linear devices or materials, such as, conduit and handrails: 12-inch length or length to be supplied, if less than 12 inches.

(e) Sample of non-solid materials, such as, sand and paint: Pint.

(f) Color selection samples: 2 inches by 4 inches.

(g) Sample panel: 4 feet by 4 feet.

(h) Sample installation: 100 square feet.

(i) Sizes of samples shall be of their respective standard unit, insofar as possible or practical, unless otherwise noted.

G) Refer to Section 09 90 00 – Paint for paint color sample requirements

2) Samples showing range of variation: Where variations are unavoidable due to the nature of the materials, submit sets of samples of not less than three units showing the extremes and middle of the range.

3) Where. Samples are for selecting of color, pattern, texture, or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

4) Quantity, unless otherwise specified:

(a) Submit three samples, or three sets of samples showing range of variation, of each required item. Project Architect will retain one approved sample or set of samples and two will be returned to Contractor.

(b) Submit one sample panel. Include components listed in technical Specification Section or as directed.

(c) Submit one sample installation, where directed.

(d) Submit one sample of non-solid materials.

5) Mount, display, or package samples in the manner specified to facilitate review of qualities indicated.

6) When a color, texture, or pattern is specified in naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.

7) Identify each Sample with information required by the paragraph entitled "Submittal Identification". Also, include information with each Sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards.

8) Refer to technical Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

f. Requirements for Mock-Ups and Field Samples:

1) Mock-ups and similar field samples specified in technical Specifications Sections are recognized as a special type of Sample. Comply with requirements for "samples" to greatest extent possible, and process transmittal forms to provide a record of activity.

2) Erect at site in locations acceptable to Project Architect.

3) Construct each mock-up or field sample; include all items required in the finish work.

4) Mock-ups or field samples shall remain in place until the work it represents has been completed and accepted by Project Architect.

5) Note and preserve the notation of the area constituting the sample installation but remove the notation at the final clean up of the Project.

g. Quality Control Set of Samples:

1) Maintain returned final set of Samples at project site, properly protected and in

suitable condition and available for quality control comparisons by Project Architect and others.

2) Quality control set shall serve as the basis for comparison for following work, and shall establish the standard of color, pattern, texture, workmanship, and other qualities as applicable when in conformance with the requirements of the Contract Documents.

h. Reusable Samples: Returned Samples that are intended or permitted to be incorporated in the Work are so indicated in other Specification Sections.

i. Incorporated Samples must be undamaged at the time of use and in complete conformance with all requirements of the Contract Documents.

E. Calculations:

1. Where calculations are required by the specifications, they shall be prepared by a registered California professional engineer who shall sign and stamp the submittal prior to submission to the Project Architect.

2. Submit five copies of required calculations for the record only. Project Architect nor its Consultants are not responsible for checking calculations.

3. Indicate all formulae and criteria used in the preparation of calculations.

4. Submit calculations on 8-1/2 by 11 inch sheets.

5. In addition to the information required by the "Submittal Information" Paragraph, include the name, address, license number, stamp and signature of the engineer.

F. Certificates of Compliance:

1. Certificates shall certify compliance with published specifications of trade, industry, or governmental organizations or specification of Project Architect and shall attest to Contractor's compliance with such specifications.

2. Where these specifications set standards by referencing published specification, submittal of certification may not be required; however, if inspection or performance at the job site after delivery and until Glendale Unified School District's final acceptance creates doubt regarding compliance, Project Architect reserves the right to receive such certification or, in event compliance cannot be certified, demand removal of questionable Work and its replacement with certifiable Work.

3. When specified in technical Specification Sections, submit manufacturers' certificate to Project Architect for review, in quantities specified for Product Data.

4. Follow same procedure as for Product Data. Where feasible, or where required by technical Specification Sections, indicate compliance with the specified standard by means of a label on the container, or on an inconspicuous place on the product.

5. Indicate how material or product conforms to or exceeds specified requirements. Submit supporting reference date, affidavits, and certifications as appropriate.

6. Certificates may be recent or previous test results on material or product, but must be acceptable to Project Architect.

7. Each certificate shall be signed by an official authorized to certify in behalf of the Contractor, supplier or manufacturer and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Certification shall not be construed as relieving

Contractor from furnishing materials and products conforming to Contract Documents.

G. Manufacturer's Instructions:

1. When specified in technical Specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

2. Identify conflicts between manufacturers' instructions and Contract Documents.

3. Installation of the items will not be allowed to proceed until the information is received. Failure to furnish the information can be cause for rejection of the material.

H. Deferred Approval:

1. Data such as manufacturer's detailed drawings, specifications, calculations and the like, submitted to obtain deferred approvals from the Department of State Architect (DSA), are in addition to, and are different from Product Data and Shop Drawings. Together with details of anchorage to structure or to building components, approved drawings and specifications will become additional Contract Documents, the same as if added by Change Order involving no change in either contract amount or in contract time.

2. Scheduling: Submit as soon as possible after award of contract. Complete, accurate, and timely submittal will minimize total time in deferred approval process.

3. Submittal:

   a. Refer to list of deferred approval items for specific requirements.

   b. For each deferred approval item, furnish a structural analysis including calculations by a structural engineer registered in State of California.

   c. Together with structural analysis, submit detailed drawings, specifications, and certified pertinent properties of nonstructural elements used in construction and in anchorage of each item.

   d. Route each deferred approval item submitted through Contractor, to Project Architect, to Contractor for correction. Any corrections and comments noted by Project Architect must be addressed and incorporated into the document prior to submission to DSA. Provide space on each sheet of drawings and on covers of specifications, structural analysis, calculations, lists of properties and the like to accommodate review and approval stamps and signatures by each of the above parties.

I. HPI Submittals:

1. Indicate design review, submittal review, commissioning coordination, system verification/start-up checklists, field inspection, and functional testing as part of overall Project timeline.

2. See Section 01 35 71 - HPI Verified Requirments for specific HPI requirments.

3. Product Data:

   a. For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content.

   b. For adhesives and sealants used inside building enclosure indicating VOC content of each product used.

   c. For paints and coatings used inside the building envelope indicating chemical

composition and VOC content of each product used.

d. Indicate VOC content in g/L calculated according to California Air Resources Board (GARB) regulations dated June, 2008.

e. Other products as listed under Credit EQ2.2 Low-Emitting Materials

f. Provide documentation that products are either identified on CHPS Low-Emitting Materials Product List or by third party certification program listing low-emitting materials/products meeting "State of California DHS Standard Practice for the Testing of Volatile Organic Compounds" testing requirements as identified on CHPS website.

J. Manufacturer's instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

K. Manufacturer's field reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
   a. Statement on condition of substrates and their acceptability for installation of product.
   b. Statement that products at Project site comply with requirements.
   c. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
   d. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   e. Statement whether conditions, products, and installation will affect warranty.
2. Other required items indicated in individual Specification Sections.

L. Verified Reports

1. Submit Verified Reports to Division of State Archictect (DSA).
   a. Comply with Title 24, California Code of Regulations, Part 1, Sections 4-336 and 4-343.

PART 2 PRODUCTS

2.01 Not Used.

PART 3 EXECUTION

3.01 Not Used.

END OF SECTION

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART1 GENERAL

1.01 SUMMARY

A. Included in this Section: This Section sets forth certain codes, standards, and relevant requirements applicable to the work required under this Contract.

1.02 STATUTORY AND JURISDICTIONAL REGULATIONS

A. Perform the Work in accordance with 2010 Edition of California Building Code (CBC) and other Applicable Code Requirements and applicable requirements of all other regulatory agencies listed in Drawings and 2010 California Green Building Standards Code Part 2.

B. Unless otherwise specified, specific references to codes, regulations, standards, manufacturer's instruction, or requirements of regulatory agencies, when used to specify requirements for materials or design elements, shall mean the latest edition of each in effect on the date of Contract Documents, or date of the Change Order or Field Order, as applicable, except where a specific date is established by codes.

C. Applicable Building Codes: References on the Drawings or in the Specifications to "Code" or "Building Code" not otherwise identified shall mean the codes indicated together with all additions, amendments, changes, and interpretations adopted by code authorities of the jurisdiction having authority over the Project.

D. Maintain copy of California Code of Regulations (CCR), Title 24, Part 1 and Part 2 in the field office during construction.

E. Maintain copy of ADAAG (American with Disability Act Accessibilities Guidelines) in the field office during construction.

1.03 PRECEDENCE

A. Where specified requirements differ from the requirements of applicable codes, ordinances and standards, the more stringent requirements shall take precedence.

B. Where the Drawings and Specifications require or describe products or execution of better quality, higher standard or greater size than required by applicable codes, ordinances and standards, the Drawings and Specifications take precedence so long as such increase is legal.

C. Where no requirements are identified in the Drawings or Specifications, comply with requirements of applicable codes, ordinances and standards of authorities having jurisdiction.

1.04 QUALITY ASSURANCE

A. Conflicts: If a conflict exists between referenced regulatory requirements, comply with more stringent establishing requirement, unless otherwise directed by Project Architect.

1.05 PERMITS

A. A building permit is required by DSA.

1.06 VERIFIED REPORTS

A. Comply with submission of Verified Reports as required by Inspector of Record.

B. Laboratory and test reports will be required from Testing Laboratory.

PART 2 PRODUCTS

2.01 Not Used.

PART 3 EXECUTION

3.01 Not Used.

END OF SECTION

SECTION 01 42 00

TESTING AND INSPECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Testing and inspection services to meet requirements of the California Building Code (CBC), Title 24, Parts 1 and 2, as indicated on the Drawings.

B. Tests of materials are required by a DSA certified testing agency as set forth in Section 4-335 of the California Building Standards Administrative Code.

1.2 RELATED SECTIONS

Provisions of the General Conditions, Supplemental Conditions and Division 01 apply to this Specification. Specifications that are referenced or related may include:

A. Section 01 31 00: Project Coordination

B. Section 01 73 29: Cutting and Patching

C. Section 01 33 00: Submittals

D. Section 01 32 00: Construction Schedule

E. Section 01 50 00: Construction Facilities and Temporary Controls

F. Section 01 77 00: Project Closeout

G. Section 01 78 00: Closeout Submittals

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION

3.1 TESTS

A. OWNER will select and provide an independent DSA certified testing agency (the agency) to conduct tests, sampling, and testing of materials. Selection of material to be tested shall be by the agency and not by CONTRACTOR.

B. Any material shipped from the source of supply prior to having satisfactorily passed such testing and inspection, or prior to the receipt of notice from IOR such testing and inspection is not required, shall not be incorporated into the Work.

C. OWNER will select, and directly reimburse, the agency for costs of all DSA required tests and inspections; however, the agency may be reimbursed by

CONTRACTOR for such costs as specified or noted in related sections of the Contract Documents.

D. The independent testing agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.

E. The agency shall not perform any duties of CONTRACTOR.

F. CONTRACTOR shall provide an insulated curing box with the capacity for twenty (20) concrete cylinders and will relocate said box and cylinders as rapidly as required in order to provide for progress of the Work.

3.2 TEST REPORTS

A. Test reports shall include all tests performed, regardless of whether such tests indicate the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Records of special sampling operations, when and as required, shall also be reported. Reports shall indicate the material (or materials) was sampled and tested in accordance with requirements of CBC, Title 24, Parts 1 and 2, as indicated on the Drawings. Test reports shall indicate specified design strength and specifically state whether or not the material (or materials) tested comply with the specified requirements.

1. The test reports shall incorporate all requirements of Title 24 Part 1, Section 4-335(d).

3.3 VERIFICATION OF TEST REPORTS

A. Each testing agency shall submit to the Division of the State Architect, in duplicate, a verified report covering all tests required to be performed by that agency during the progress of the Work. Such report, covering all required tests, shall be furnished prior to Substantial Completion and/or, when construction on the Work is suspended, covering all tests up to the time of Work suspension.

1. The test reports shall incorporate all requirements of Title 24 Part 1, Section 4-335(e).

3.4 INSPECTION BY OWNER

A. OWNER, and its representatives, shall have access, for purposes of inspection, at all times to all parts of the Work and to all shops wherein the Work is in preparation. CONTRACTOR shall, at all times, maintain proper facilities and provide safe access for such inspection.

B. OAR shall have the right to reject materials and/or workmanship deemed defective Work and to require correction. Defective workmanship shall be corrected in a satisfactory manner and defective materials shall be removed from the premises and legally disposed of without charge to OWNER. If CONTRACTOR does not

correct such defective Work within a reasonable time, fixed by written notice and in accordance with the terms and conditions of the Contract Documents, OWNER may correct such defective Work and proceed in accordance with related Articles of the Contract Documents.

C. CONTRACTOR is responsible for compliance to all applicable local, state, and federal regulations regarding codes, regulations, ordinances, restrictions, and requirements.

3.5 INSPECTOR OF RECORD

A. A DSA approved and certified Inspector of Record (IOR) shall be employed by OWNER in accordance with requirements of Title 24 of the California Code of Regulations with their duties specifically defined therein. Additional DSA certified inspectors may be employed and assigned to the Work by OWNER in accordance with the requirements of California Building Standards Administrative Code with their duties as specifically defined in Section 4-333(b).

B. Inspection of Work shall not relieve CONTRACTOR from any obligation to fulfill all terms and conditions of the Contract Documents.

C. CONTRACTOR shall be responsible for scheduling times of inspection, tests, sample taking, and similar activities of the Work.

3.6 TESTS AND INSPECTIONS

The following tests and inspections do not limit inspection of the Work but are required by DSA, other agencies, or are required in related Sections of the Contract Documents.

A. Excavations, Foundations and Retaining Walls - CBC, Chapter 18A:

1. Inspection:

a. Excavation, Filling and Compaction	1701A.5.13

B. Concrete - CBC, Chapter 19A:

1. Materials:

a. Test of Materials	1903A.1; 1916A.1 – ACI 318
b. Portland Cement Tests	1903A.3; 1916A.1 – ASTM C 150
c. Concrete Aggregate	1903A.5 – ACI 318
d. Reinforcing Bars	1903A.7; 1916A.2 – ACI 318
e. Structural Steel, Steel Pipe or Tubing	ACI 318 Sec. 3.5.6
f. Admixtures	ACI 318 Sec. 3.6

2. Quality:

a. Proportions of Concrete	1905A.1; 1905A.2; 1905A.3; 1905A.4; 1905A.5; 1905A.6; 1905A.7 1904A.
b. Mixing and Placing	1905A.1.1; 1905A.2; 1905A.3, 1905A.4
c. Concrete Testing	1905A – ACI 318
d. Insulating Concrete Tests	1701A.5.9
3. Inspection:	
a. Project Site Inspection	1704A
b. Batch Plant or Weigh-master Inspection	1704A.4.2; 1704A.4.3
c. Reinforcing Bar Welding Inspection	1704A.3.1.3
C. Aluminum - CBC, Chapter 20A:	
1. Aluminum	2002.1
2. Inspection:	2003.1
D. Masonry - CBC, Chapter 21A:	
1. Materials:	
a. Masonry Units	2103A.1,2,3,4,5,6,7
b. Portland Cement	2103A.10.7
c. Mortar & Grout Aggregates	2103A.12
d. Reinforcing Bars	2103A.13
2. Quality:	
a. Portland Cement Tests	2105A.1, 2105A.2
b. Mortar & Grout Tests	2105A.5
c. Masonry Prism Tests	2105A.3
d. Masonry Core Tests	2105A.4
e. Reinforcing Bars	2103A.13
3. Inspection:	
a. Reinforced Masonry	1704A.5;1704A.5.3,
b. Reinforcing Bar Welding Inspection	1704A.3.1
E. Steel - CBC, Chapters 17A & 22A:	
1. Materials:	
a. Structural Steel & Cold Formed Steel	2202A.1; 2205A
b. Material Identification	2203.A

2. Inspection and Tests:

a. Test of Structural Steel	1704A.3; 2212.A
Table 1704A.3.	
b. Tests of High Strength Bolts,	1704A.3.3; 2212.A.1
c. Tests of End Welded Studs	1704A.3.1: 2212A.2
d. Shop Fabrication Inspection	1704A.3.2.1
e. Welding Inspection	1704A.3.1
f. High Strength Bolt Inspection	1704A.3.3
h. Spray applied fire resistance materials	1701A
i. Non-Destructive Items	1703A
j. End-Welded Studs Inspection	2212A.2

F. Exterior Wall Coverings - CBC, Chapter 14A, 25A:

1. Materials:

a. Portland Cement Plaster	2510

2. Inspection:

a. Veneer Inspection	1405A.4

END OF SECTION

SECTION 01 42 10

REFERENCE STANDARDS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. General requirements for reference standards pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.02 REFERENCE AND STANDARD TYPE SPECIFICATIONS:

Specifying by reference to a reference and standard type specification document or to another portion of the Contract Documents shall be the same as if the referenced document or portion of the Contract Documents referred to were exactly repeated at the place where such reference is made. In case of a conflict between the requirements of regulatory agencies and the referenced and standard type specification documents, Contractor shall conform to the most restrictive requirement if such conformance is legal.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

SECTION 01 42 16

DEFINITIONS

PART1 GENERAL

1.01 SECTION INCLUDES

A. Supplements the definitions contained in the General Conditions.

B. Other definitions are included in individual specification sections.

C. This section includes Industrial Standards.

1.02 DEFINITIONS

A. Approved, Approved Equal, Or Equal: As approved and accepted by Project Architect and Owner as defined in the General Conditions and Section 01 60 00 of the Specifications.

B. As Necessary: Essential to the completion of the Work.

C. As Required: As required by the Contract Documents.

D. As Selected, As Approved, As Directed or words of similar import: As selected by, as approved by, or as accepted by the Project Architect. No implied meaning shall be interpreted to extend Project Architect's responsibility into the Contractor's area of Contractor's supervision.

E. As shown, As Detailed, As Indicated and words of similar import: As indicated on the Drawings.

F. Building Department and Authorities Having Jurisdiction: All agencies, individually or collectively, charged by statute with administration/enforcement of the requirements of the Building Code at the Project location.

G. Control Sample: Sample of material of approved color, finish and texture, available for the Contractor's review in Project Architect's office.

H. Concealed: Embedded in masonry, concrete or other construction, installed within furred spaces, within wall/partitions or above suspended ceilings, in trenches, in crawl spaces, or in enclosures.

I. Cutting: Removal of material by cutting, sawing, drilling, breaking, chipping, grinding, excavating and similar operations.

J. Division: Division of these Specifications except where the obvious intent is the act or process of dividing. Divisions are groups of related Sections.

K. Directed, Requested, Authorized, Selected, Reviewed, Required, Accepted, and Permitted: Directed by Architect, requested by Architect, and similar phrases. However, no such implied meaning will be interpreted to extend Project Architect's responsibility into the Contractor's area of construction supervision.

L. Defective Work: Work that is unsatisfactory, faulty, omitted, incomplete, deficient, or does not conform to the requirements of the Contract Documents, or the requirements of inspection, reference standard, test, or approval specified in the Contract Documents, or has been damaged prior to final completion, unless responsibility for the protection of such work has been assumed by the Owner through beneficial occupancy in accordance with provisions of the Contract.

M. DSA: Department of State Architect, State of California. This is the Authority having

Jurisdication for this school.

N. Furnish, except as otherwise defined in greater detail: "Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations," as applicable in each instance.

O. Install, except as otherwise defined in greater detail: Used to describe operations at project site, including "unloading, unpacking, assembly, erection, placing, anchoring. applying, working to dimension, finishing, curing, protecting, cleaning, and similar operation," as applicable in each instance.

P. Equipment: A product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

Q. Experienced, when used with an entity: Having successfully completed a minimum of 5 previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

R. Exposed: Not installed underground or concealed as defined above.

S. Exterior: A space that does not meet the definition for "interior" below.

T. Fabricated: Items specifically assembled or made out of selected materials to meet individual design requirements for the Project.

U. Factory Finished/Prefinished: Finished under controlled environmental conditions off site, and requiring no additional finish, except for touchup, at the Project site.

V. Furnish: To supply, deliver, unload, and inspect for damage.

W. Indicated: Graphic representations, notes or schedules on Drawings, reference to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in the Contract Documents. Similar terms such as "shown," "noted," "scheduled," and "specified" may be used in lieu of "indicated," are used for the purpose to help the reader locate the reference; no limitation of location is intended except as specifically noted.

X. Include/Including: Include/including, without limitation.

Y. Install (Services or Labor): To place in final position, complete, anchored, connected, and in operable condition.

Z. Installer: Means the Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

AA. Interior: A space completely enclosed by walls, solid door(s), floor and ceiling.

AB. Manufactured applies to standard units usually mass-produced.

AC. Manufacturer's Directions, Instructions, Recommendations, Specifications: Manufacturer's written directions, instruction, recommendations, specifications.

AD. Manufacturer Warranty is a pre-printed warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

AE. Match: Providing a portion of the Work using the same product, technique, sequence; dimensions, finishes, color, texture, and degree of craftsmanship as (a) another portion of the Work, (b) existing conditions adjacent to the new portion of the Work, (c) as an approved

sample, range of samples, or mockup or sample panel, or (d) as a control sample in the Owner's or Architect's possession.

AF. Materials: Products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

AG. Named Products are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer published product literature current as of the date of the Contract Documents.

AH. Patching: To restore a surface to its original completed condition by filling, repairing, refinishing, closing and similar operations.

AI. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items not previously incorporated in another project or facility, except that products consisting of recycled-content materials are allowed, unless stated otherwise. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

AJ. Project Site: The space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

AK. Provide: To supply, fabricate, deliver, place, and connect, complete in-place, ready for operation and use. When neither furnish, install nor provide is stated, provide is implied.

AL. Regulations: Includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

AM. Remove: To remove item completely including attachments, frames, anchors, fittings, bases, pipes, conduits and supports, capping behind finished surfaces and repairing floors, bases and walls to match color and texture and be smooth with existing adjacent surfaces.

AN. Section: Section of these Specifications, except where the obvious intent is one of several components, a piece. Section is usually a basic unit of Work.

AO. Shall is mandatory.

AP. Similar: A portion of the Work that matches the whole or part of another portion of the Work but has a different geometric configuration.

AQ. Special Warranty: A warranty, sometimes pre-printed, required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide additional warranty coverage for Owner.

AR. Submit, Submittal and Submission: To submit to Project Architect for review, unless otherwise stated.

AS. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

AT. Symmetrical: A portion of the Work which matches adjacent work, or itself, but reversed about centerline(s) or the axis of a surface or a space.

AU. Testing Laboratories: An independent entity engaged to perform specific inspections or tests of the work, either at the Project site or elsewhere, and to report, and (if required) interpret results of those inspections or tests.

AV. Weathertight: That the assembly, joint and/or material specified will not allow water, in any form, and air to penetrate the assembly, joint and/or the material so specified in the building.

1.03 INDUSTRIAL STANDARDS

A. Applicability of standards:

1. Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

2. No provisions of any referenced standards or specifications (whether or not specifically incorporated by reference in the Contract Documents) shall change the duties and responsibilities of the Owner, or Contractor, or any of their consultants, agents or employees from those set forth in the Contract Documents.

3. If compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding, including preparation of shop drawings.

4. Where both a standard and a brand name are specified for a product in the Project Manual, the proprietary product named shall conform to or exceed the requirements of the specified reference standard.

5. The listing of a trade name in a Project Manual is not a warranty that such product conforms to the respective reference standard.

B. Publication dates: Comply with standards in effect as of date of the Building Permit, unless otherwise indicated and listed in applicable Codes.

C. Minimum quantity or quality levels:

1. The quantity or quality level shown or specified shall be the minimum provided or performed.

2. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits.

3. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

D. Copies of standards:

1. Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

a. Where copies of standards are needed to perform a required construction activity, obtain them directly from publication source and make them available on request.

2. Abbreviations and acronyms: Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the US".

PART 2 PRODUCTS- NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 43 00

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 DESCRIPTION

A. All inspection and testing required to establish compliance with Contract Documents and Title 24 CCR requirements, except as may be otherwise specified, shall be made by an independent professional testing agency or firm selected and paid by the Owner/District (or as otherwise noted). All work prior to the call out of the inspection services shall be approved by the Inspector of Record as ready for the inspection services.

B. The cost of most services for testing and inspection in compliance with Contract Documents requirements will be paid by the Owner. If initial tests indicate non-compliance with Contract Document requirements, any non-compliance testing shall be performed by the same inspection service and back charged to the General Contractor. Schedule portions of the work requiring testing and inspection services so that the time of the agency on the work is as continuous and brief as possible. Should an inspection service be called out without proper pre-inspection and approval by the Inspector of Record, and the Contractor causes the inspection service to be on site for longer than the minimum call-out costs, or the Contractor causes the inspection service to make a return call to the site for the same inspection, the additional costs shall be back-charged to the Contractor.

C. Concrete Coring Procedures: Prior to the start of any concrete coring, the Contractor shall submit a detailed coring plan, indicating the size and precise locations of the cores, for approval by the Architectural Team/Structural Engineer. Proposed coring locations must be marked in the field and verified by the District IOR. The project Architectural Team/Structural Engineer may also request to perform a field inspection if deemed necessary. The Contractor SHALL arrange for and bear the costs of all Pachometer tests of the areas to be cored.

1.02 CONTRACTOR'S RESPONSIBILITY

A. Coordination: The Contractor shall initiate and coordinate testing and inspections required by the Contract Documents and public authorities having jurisdiction over the work through the Architect and/or Inspector of Record.

B. Access: Furnish free and safe access to the various parts of the work and assist testing and inspection personnel in the performance of their duties at no additional cost to the Owner.

C. Data: Furnish records, drawings, certificates, and similar data as may be required by the testing and inspection personnel to assure compliance with the Contract Documents.

D. Notification: Provide the Architect and/or Inspector of Record and Testing Laboratory with at least 72 hours advance notification of required testing.

E. Defective work: Remove and replace any work found defective or not complying with Contract Document requirements at no additional costs to the Owner (shall apply to 1, 2, and 3 immediately below). Where testing personnel take cores or cut-outs to verify compliance, repair prior to acceptance and as approved by the District IOR.

1. Concrete: If test cylinders for concrete fail to meet design stresses, make core and load tests as may be directed by the Design Professional; make core tests in accordance with an ASTM C42 or most recent update and load tests in accordance

with ACI 318 or most recent update. Correct all deficiencies found in forms, reinforcing steel and embedded items.

2. Structural Steel: Should any weld or structural connection fail to meet design stresses, provide sonic or x-ray examination of all structural connections as directed by the Architect/engineer. Replace or repair all defective connections as directed.

3. Roofing membrane work: Should roofing membrane, including associated flashing and jointing, indicate non-compliance with Contract Document requirements, provide corrective work as directed.

F. Lead Levels in Water: The domestic water piping system shall be protected during tie-ins or other construction activities that have the potential to elevate the lead levels in the water. The water in the domestic water piping shall be tested prior to the start of work and the lead levels documented. Testing shall also be performed upon the completion of all work and any lead contamination, above the levels documented prior to the start of work shall be the Contractors responsibility to reduce the levels to the pre-project levels.

1. If the domestic water system is contaminated as a result of construction activities, the Contractor shall decontaminate the domestic water system. The procedures shall comply with applicable regulatory requirements.

1.03 TESTING LABORATORY RESPONSIBILITY

A. Taking Specimens: Specimens and samples for testing, unless otherwise provided in the Contract Documents, will be taken by the testing personnel. Sampling equipment and personnel will be provided by the testing laboratory. Deliveries of specimens and samples of the testing laboratory will be performed by the testing laboratory.

1. When the testing laboratory is ready to test, but is prevented from testing or taking specimens due to incompleteness of the work or other scheduling lapses, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

B. Test Reports: Reports shall include all tests made, regardless of whether such tests indicate that material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Reports shall state which requirements with which the material or materials were sampled and tested. Test reports shall show the indicated or specified design strength(s) and state definitely whether or not the materials tested comply with the specification requirements.

Report distribution shall be made as follows:

Owner's Rep	1 copy, and 1 electronic pdf
Architect	1 copy, and 1 electronic pdf
Structural Engineer	1 copy
Contractor	2 copies
DSA	2 copies (or as req'd by DSA)

C. The inspection agency shall cooperate with the Contractor so as to cause no delay in the progress of the work, but shall be directly responsible to the Owner for his actions. The inspection agency shall have no authority to direct the work of the Contractor.

D. Submittals: Promptly submit copies of reports of inspections and tests, mill analysis, concrete mix designs and certifications per applicable sections of the specification.

1. Comply with requirements of each technical specification section and DSA requirements.

2. Reports shall include all tests made, regardless of whether such test indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Records of special sampling operations as required shall also be reported. The reports shall show that the material or materials were samples and tested in accordance with the requirements of the Title 24 and with the approved specifications. Test reports shall show the specified design strength. They shall also state definitely whether or not the material or materials tested comply with requirements.

3. Testing Agency is not authorized to:

   a. Release, revoke, alter, or enlarge on, requirements of Contract Documents.

   b. Perform any duties of the Contractor.

1.04 REQUIRED INSPECTIONS & TESTS

The following are inspection services and tests required of but not limited to the Inspection and Testing Agency.

A. Sitework inspections & tests: Perform the following services as required to assure compliance with requirements of Division 2 of the technical specifications.

Compaction & bearing: Test and verify bearing capacity of all load bearing earth, test compaction fills for compliance with required densities.

B. Concrete work inspections & tests: Perform the following services as required to assure compliance with requirements of Division 3 of the technical specifications.

1. Cast-in-place concrete: Make slump tests for each batch delivered or at least 1 test per hour during continuous pours in accordance with requirements of ASTM C143; check and verify batch consistency. Inspect forms and verify sizes and conditions. Inspect reinforcing and verify its proper placement. Furnish continuous inspection during replacement, repair and patching operations, and curing of concrete. Make cure, and test at least 3 test cylinders of each strength, of concrete for each 50 cubic yards (38.23 m3) placed or for each day's pour, whichever is greater. Report exact mix tested, minimum size aggregate, location of pour in the work, cylinder identification, data of receipt of cylinder in laboratory, slump data, cement brand and type, admixtures used, dates and records offset cylinders, names of inspectors and laboratory personnel, and evaluation or analysis of cause, in case of test failure, and recommendations of remedial action.

2. Cure specimens under laboratory conditions except when there is possibility of surrounding air temperature falling at project below 40F. In this case, additional specimens will be required to be cured under job conditions. For all test unless otherwise directed, break 1 cylinder at 7 days, 2 at 28 days.

3. If 7 day tests appear to be marginal or fall below normal requirements, concrete shall be tested with an approved impact hammer. Should these readings verify low test cylinders, procedure of work beyond this point will be Contractor's responsibility until decision is reached as to removal of substandard concrete at each of 28 day period.

C. Metal work inspection & tests: Perform the following services as required to assure compliance with requirements of Division 5 of the technical specifications.

1. Structural steel fabrication: Furnish visual inspection of all shop fabricated parts including joists and joist girders. This inspection may be done in shop or in field after delivery. Furnish inspection and testing of shop welds in accordance with requirements for welding specification hereinafter. Check shapes, sizes, classes, and types of steel. Verify conformance of structural steel materials with requirements of Contract Documents. Test end welded studs, replace studs damaged by test.

2. Structural steel field inspection & tests: Check location and fit of all anchorage and inserts. Verify adjustments to fit inaccuracies. Furnish visual inspection of erection of all structural steel components of the work. Furnish inspection and testing of all field welding in accordance with requirements for welding in accordance with requirements for bolting specific hereinafter. Inspect and test all bolted connections in accordance with requirements for welding specified hereinafter. Inspect for compliance with AISC Code of Standard Practice with requirements of the Contract Documents; other duties and responsibilities as may be noted on drawing.

3. Welding requirements: Furnish visual inspection of all field fillet welding. Furnish inspection of fillet welds in accordance with requirements of AWS D1.1 (Rev. I): allow for inspection of a minimum of 15% of fillet welds by magnetic particle or dry penetrant methods

4. Bolting requirements: Furnish visual inspection of structural joints where ASTM A325 bolts are used; verify the applicable requirements of AISC specifications are met.

D. Thermal and moisture protection work testing & inspection: Perform services as required to assure compliance with requirements of Division 7 of the technical specification.

E. Roofing: Check deck surfaces prior to application of roofing materials and verify that substrate is in satisfactory conditions to receive roofing. Furnish continuous inspection during application of roofing, including application of vapor barriers, insulation and roofing. Inspect all sheet metal flashings, counterflashing and reglets for satisfactory and waterproof installation.

F. Wood: Check framing lumber moisture content prior to framing.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Tests and inspections.

1.02 RELATED SECTIONS:

A. Work to be tested or inspected: Respective Sections.

1.03 TESTS AND INSPECTIONS; GENERAL:

A. General:

1. See General Conditions and Supplementary General Conditions.

2. Inspection: Per Title 24, 108 & 1701.

B. Contractor: Shall furnish labor, materials, and equipment and perform all operations required to take and prepare test samples, and required to permit inspection of all work.

C. Contractor responsibility: Each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the *building official* and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain acknowledgment of awareness of the special requirements contained in the statement of *special inspection*, per Section 1709A.1 2010 CBC.

D. Payment of Tests & Inspections Costs:

1. District: District will pay all costs for required testing and inspection of both on-site and off-site work; except where specifically noted otherwise.

2. Costs to be reimbursed to District by Contractor:

a. Cost of testing materials, which fail to meet requirements of Contract Documents.

b. Overtime Costs: Whenever Contractor elects to work during hours other than normal work week and laboratory inspection is required, District will pay normal cost of laboratory inspection and Contractor shall pay that portion of laboratory inspection cost due to "overtime".

c. Where specifically noted.

1.04 TESTING AGENCY:

A. All tests shall be made by a well-established, independent Testing Laboratory(s) selected by District and satisfactory to the Architect and the Division of the State Architect.

1.05 RESULTS:

A. Test Reports:

1. Testing Laboratory to report results of all tests in writing.

2. Reports shall state that:

a. Tests were made under responsible charge of a Testing Engineer, licensed to practice Civil/Structural Engineering, State of California.

b. Material(s) were tested per requirements of Contract Documents and Division of the State Architect.

c. Material(s) PASSED or FAILED TO PASS requirements.

3. Report (s), Distribution:

Architect.....1 hard copy;1 electronic pdf
Inspector.....1 hard copy
Contractor.....1 hard copy
District .....1 electronic pdf
DSA .....2 copies (or as req'd by DSA)

B. Certificate: Each time work on this project is suspended and upon completion of the work, the Testing Laboratory shall furnish a notarized certificate in duplicate to the Division of the State Architect stating:

1. Tests for the work were made per requirements of Contract Documents and Division of State Architect.

2. All such tests and reports made for the work were reported.

3. A list of all tests performed.

1.06 REQUIRED TESTS AND INSPECTIONS (CRC, 1998):

A. General: Tests and inspections are referenced to Specification Divisions and Sections.

B. Excavation, Foundations and Retaining Walls – CBC, Chapter 18A:

1. Inspection:

a. Earth Fill.

C. Division 3, CONCRETE – CBC Chapter 19A:

1. General Requirements: Apply to all Division 3 work.

a. Concrete "Design Mixes":

1) By District designated Testing Laboratory, per Section 1904A and Section 905A.5 through 1905.A.1, Title 24, by Method B or C.

2) District will pay cost of one direct-pour mix and/or one pump mix for each specified concrete strength in each aggregate type.

b. Batch Plant Inspection: Continuous inspection by Testing Laboratory for all "structural concrete", per Title 24, Section1929A.4. The Contractor shall notify the Laboratory 24 hours in advance of the time concrete is to be mixed, and shall promptly notify the Laboratory of postponement or cancellation of mixing. The Contractor shall reimburse the District for costs incurred resulting from failure to give adequate notification of postponement or cancellation.

c. Cement:

1) Testing: Where not accompanied by a D.S.A. acceptable manufacturer's mill analysis and test certificates, test per Section 1903A.2 and 1929A.1, Title 24.

2) Contractor to reimburse District for testing costs.

d. Concrete Consistency: Measure consistency by the "Standard Method of Test for Slump of Portland Cement Concrete", ASTM C-143. The District Inspector shall make this test twice each day or partial day's run of the mixer.

e. Aggregate: Test in accordance with ASTM 33 and ASTM Method C227. Tests shall be less than one year old.

f. Concrete Test Cylinders: District's Inspector to make and cure per UBC Standard 19-10.

g. Concrete Testing:

1) Test per Section 1905A.6, Title 24.

2) Make one test at 7 days, and one test at 28 days; except, do not make 28-day test when 7-day test meets final design strength.

3) Where concrete does not meet design strength, take core samples; and test per Section 1905A.6.4, ASTM C42 and as follows:

a) The cores shall be taken at representative places throughout the structure as designated by the Structural Engineer and shall be at least 4" in diameter.

b) In general, sufficient cores shall be taken so that knowledge will be had for all pours made. At least three cores shall be taken for each 4000 square feet of building. Not less than three cores shall be taken from each building.

c) Where cores have been cut from the work, the Contractor shall fill the void with drypack and patch the finish to match the adjacent existing surfaces.

h. Inspection:

1) General: Conform to Title 24, Section 1701A.

2) Steel Reinforcement: By District's Inspector for proper size and location, prior to placing concrete.

3) Concrete: Continuous inspection of all concrete placements by District's Inspector. Keep a "placing record" of pours per Title 24, Section 1905A.7.

2. Cast-In-Place Concrete:

a. Test all structural concrete.

b. Two (2) molded cylinders for testing for each truck load and for each grade of concrete. Not less than one test/day/each grade of concrete.

c. Slump test each truck load of concrete delivered to the job site.

D. Division 3, STEEL REINFORCEMENT:

1. Testing:

a. Conform to Title 24, Section 1903A.5.3 and 1929A.2.

b. Test for conformity with UBC Standard 19-4 (Which is based on ASTM A615).

c. Tests:

1) Where identifiable by manufacturer's heat number and mill analysis report: one tension and one bend test/each 10 tons or fraction thereof for #5 and larger bars.

2) When not identifiable: one tension and one bend test/each 2 ½ tons, or fraction thereof, for all bar sizes.

2. Inspection: See Paragraphs C and D above. Welding shall conform to Title 24, Section 1929A.12.

E. Division 4, MASONRY – CBC Chapter 21A:

1. Materials:

a.	Masonry Units	2102A.2, (4,5,6)
b.	Portland Cement	2102A.2.2 (2,3), 2103A2.
c.	Mortar and Grout Aggregates	2102A.2.1; 2103A.4.3, A4
d.	Reinforcing Bars	2102 A.2.10; 1903 A5, 1929 A.2

2. Quality:

a.	Portland Cement Tests	1903 A.2; 1929 A.1
b.	Mortar and Grout Tests	2105 A.1, 2105 A.3.4.2
c.	Masonry Core Tests	2105 A3.1
d.	Reinforcing Bars	1929 A.2

3. Inspection:

a.	Reinforced Masonry	2105 A7
b.	Reinforcing Bar Welding Inspection	1929 A.12, 1903 A.10

F. Division 5, METALS:

1. Testing; Structural Steel:

a. General:

1) Conform to Title 24, Section 2231A.

2) Contractor to obtain manufacturer's certified mill analysis and test report for each heat.

3) Identification: Conform to Title 24, Section 2203A.

4) Testing Lab to verify steel identification, per ASTM A6, at fabricator's shop.

b. Tests:

1) Where not accompanied by acceptable identification, test material.

2) Contractor to reimburse District for testing costs.

3) Structural Steel; Title 24, Section 2231A.1.

2. Field Testing; Wedge-Type Expansion Anchor Bolts:

a. Conform to Title 24, and D.S.A. requirements. Inspector shall witness all tests.

b. All tests to be made with suitable, properly calibrated devices.

c. Tension test 50% of the anchor bolts for pull-out using twice the bolts allowable capacity.

d. If any bolt fails, all adjacent bolts must be tested.

3. Inspectors, General: All Inspectors shall be specially qualified and approved by DSA for the particular type of work they are inspecting.

4. Inspection, Welding:

a. Conform to Title 24, Section 2231A.5. Keep a systematic record of all welds.

b. AWS certified Welding Inspector from Testing Lab approved by DSA, shall inspect all shop and field welding for structural steel.

c. Welding Inspector shall check qualifications and ability of all welders to perform satisfactory work.

1) Inspector shall spend first fabrication day in shop observing specific techniques, welds, and welders to be used on the work.

d. Welding Inspector shall check and approve the type and capacity of all welding equipment, which shall conform to manufacturers' recommendations.

7. Testing, Welds: By Testing Lab.

a. Ultra Sonic Tests: Perform for all full penetration welds of 1/4" or greater.

b. Other Tests: As noted or required.

8. Inspection, Shop Fabrication: Conform to Title 24, Section 2231A.4 by specially qualified Inspector from Testing Lab.

9. Certificates: Testing Lab and its Inspectors shall certify that all material, equipment, fabrication, installation, welding, procedures, and work observed and/or tested by them is satisfactory and conforms to requirements of Contract Documents and Division of State Architect; and that they have used all means necessary to determine quality of welds.

G. Wood – CBC, Chapter 23A:

1. Materials:

a.	Lumber and Plywood Grading	2305A
b.	Glue – Laminated Members	2312A.3, 2312A.6

2. Inspection:

a.	Glue-Laminated Fabrication	2327A.1
b.	Timber Connectors	2327A.2
c.	Manufactured Trusses	2327A.3

H. Exterior Wall Coverings – CBC, Chapter 14A:

1. Materials:

a. Portland Cement Plaster Chapter 25A

2. Inspection:

a.	Veneer Inspection	1405A

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

SECTION 01 45 05

SAFETY PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall ensure that all employees, visitors, subcontractors, subcontractor employees, and suppliers, while on the worksite, comply with the requirements of OSHA, these requirements, and the safety precautions contained in the several Specification Sections.

B. The Contractor shall promptly and fully comply with and execute, without separate charge thereof to the District, shall enforce compliance with the provisions of the Williams Steiger Occupational Safety Health Act of 1970 (Public Law 91-596 with most recent updates and amendments) with particular attention paid, but not limited to, Title 29-Labor, Chapter XVII
- Occupational Safety and Health Administration, Department of Labor Part 1926- (Safety and Health Regulations for Construction), and part 1910 - (Occupational Safety and Health Standards), as printed, respectively, in the June 24, 1974, and June 27, 1974, Federal Register, and latest adopted amendments and changes thereto.

1.02 PRELIMINARY WORK

A. Prior to the start of and during the course of the work (above and below ground) the Contractor shall make a thorough survey of the entire worksite to determine all potential hazards. Workmen shall be made aware of those hazards and shall be instructed in procedures and the use of equipment for their protection. The Contractor shall verify the location and condition ("live" or "dead") of all utilities on and near the worksite and take precautions to protect his employees, subcontractors, material men, the general public, and the property.

1.03. IMMINENT DANGER

A. The District may stop those operations which create an imminent danger to employees (as defined by OSHA), to the public and to property.

B. The Contractor shall be wholly responsible for any accident (including death) occurring at any time during the progress of the work and until the final acceptance of the work by the District which may happen to any of his employees/workmen or those of any Subcontractor employed on the building, the property, or for any damage or injuries (including death) which his work and operations may cause to the work being constructed, or to existing buildings, or to any tenants and occupants of the property, or of the adjoining properties, or to the public, or to any public or private property.

1.04 COOPERATION:

A. The Contractor shall cooperate with the safety representatives of the District, District's Insurance Managers and the District's Insurance Company in any and all inquiries before, during, and after the project.

1.05 SAFETY RESPONSIBILITIES:

A. Contractor's Superintendent shall:

1. Ensure compliance with these requirements, OSHA requirements and other safety requirements, and provide and implement an Injury and Illness Prevention Program (IIPP) at the project site.

2. Provide, supervise, and support a Contractor's Project Safety Supervisor and enable him/her to execute effectively their duties and responsibilities.

3. Authorize immediate action to correct substandard safety conditions.

4. Review and act to ensure compliance with safety procedures with his supervisors, subcontractors and suppliers.

5. Take an active part in all supervisory safety meetings.

6. Cooperate with safety representatives of the District, District Insurance Managers, and the District's insurance company.

7. Ensure that all security and temporary fencing has been secured to prevent any movement or causal action that could contribute to any hazardous or unsafe condition, or which ultimately may cause harm.

B. Contractor's Project Safety Supervisor shall:

1. Make thorough daily safety inspections of the worksite and immediately act to eliminate unsafe acts and unsafe conditions, and record all suggestions make and corrective action taken.

2. Investigate worksite accidents and recommend immediate corrective action.

3. **Weekly safety meetings shall be conducted and documented in the daily report of activity by the contractor. Weekly safety meeting notes shall be recorded, noting the contractors and trades on site, the topics that were discussed and the signatures of those workers who attended. These notes shall be submitted to the Project Manager on a weekly basis.**

4. Review safety meetings reports submitted by job foremen and act to ensure that
meaningful weekly safety meetings are held by the job foremen.

5. Attend foremen "tool box" safety meetings and evaluate effectiveness.

6. Assist in the preparation of accident investigation and reporting procedures.

7. Implement training programs for supervisors and employees as they apply to their specific responsibilities.

8. Be responsible for the control, availability, and use of safety equipment, including employee personal protective equipment.

9. Coordinate his activities with those of the District's Inspector and/or Project Manager, and immediately implement their safety suggestions.

10. Coordinate public relations aspects of the Contractor's safety program.

C. Contractor's Job Foreman shall:

1. Instruct workmen regarding safe work practices and work methods at the time workmen are given work assignments.

2. Furnish and enforce the use of personal protective equipment and suitable tools that are equipped with all the manufacturer's supplied safety features, and have not been altered in any way, for the job.

3. Continuously check to see that no unsafe practices and conditions are allowed to exist on this portion of the work.

4. Set a good example for his personnel.

5. Make a complete investigation of accidents to determine facts necessary to take corrective action to prevent a recurrence, and record the facts in a written report to accompany the daily report as set forth in the IIPP.

6. Promptly supply information for, or complete, an Accident Report and Investigation Form as directed by the Contractor Safety Supervisor and Contractor's Superintendent/Project Manager.

7. Hold weekly "tool box" safety meetings with his personnel to:

a. Discuss observed unsafe work practices and unsafe conditions.

b. Review the accident experience of his crew and discuss correction of the accident causes.

c. Encourage safety suggestions from his crew and report those suggestions to the Safety Supervisor.

8. Ensure that first aid is promptly administered to an injured employee.

9. Report immediately, to Contractor's Superintendent/Project Manager, or Safety Supervisor, any injuries, or violations of job safety and security.

D. Subcontractor's Job Superintendent shall:

1. Plan and execute his work so as to comply with the Construction Safety Program.

2. Furnish and enforce the use of personal protective equipment.

3. Attend supervisory personnel safety meetings schedule by the Contractor.

4. Schedule and attend weekly "tool box" safety meetings to be held by job foremen for all employees.

5. Report to the Contractor's Project Safety Supervisor or Contractor's Superintendent all observed unsafe conditions, unsafe practices, and violations of job security.

6. Cooperate with the District's safety representative.

1.06 CONTRACTOR'S SAFETY SUPERVISOR:

A. Contractor shall designate a full-time employee as Contractor Project Safety

Supervisor. B. Qualifications must be approved by the District. Supervisor shall:

1. Have heavy construction experience of not less than three (3) years, one of which must have been in a supervisory capacity.

2. Be familiar with job safety laws and regulations.

3. Have accident prevention experience.

C. Duties: Project Safety Supervisor shall conduct regular inspections of the work, shall ensure compliance with job safety requirements, shall maintain the Contractor's safety program IIPP on site and available for review by the District's Inspector and/or Project Manager and shall enforce safe practices, use of safety equipment and personal protective equipment, and other such activities as may be required by OSHA, the safety requirements, and the safety precautions contained in the several Specification Sections.

D. If the Project Safety Supervisor is not effective in executing the duties assigned him, the District may request, in writing, that the Contractor furnish a new Project Safety Supervisor.

E. If the Contractor desires to replace the Project Safety Supervisor, he shall so notify the District and the District's Insurance Managers, in writing and shall submit the name, experience and qualifications of the proposed Project Safety Supervisor for approval.

1.07 REQUEST FOR VARIANCES

A. Request for variances to deviate from OSHA requirements must follow the current established procedures by that Agency.

1.08 FAILURE TO COMPLY

A. If the Contractor fails to comply with the requirements of OSHA, the safety requirements, and the safety precautions contained in the Specifications Sections, or to provide an on-site IIPP, the District may modify or stop the work and portions thereof, until such failure is remedied. Willful and repeated failure to comply could result in the shutdown of the work, and portions thereof. No part of the time lost due to any such modification of operations or stop orders shall be made the subject of a claim for extension of time or for increased costs of damage by the Contractor.

PART 2- PRODUCTS- (NOT USED)

PART 3- EXECUTION –(NOT USED)

END OF SECTION

SECTION 01 45 33

CODE-REQUIRED SPECIAL INSPECTIONS

PART1 GENERAL

1.01 SECTION INCLUDES

A. Code-required special inspections.

B. Testing services incidental to special inspections.

C. Submittals.

D. Manufacturers' field services.

E. Fabricators' field services.

1.02 DEFINITIONS

A. Code or Building Code: 2010 Edition of the California Building Code and, more specifically, Chapter 17A- Structural Tests and Inspections, of same.

B. Department of State Architect (DSA): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.

C. Special Inspection:

1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the DSA that also require special expertise to ensure compliance with the approved contract documents and the referenced standards.

2. Special inspections are separate from and independent of tests and inspections conducted by Glendale Unified School District or Contractor for the purposes of quality assurance and contract administration.

1.03 SUBMITTALS

A. See Section 01 33 13 - Submittal Procedures.

B. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency shall:

1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.

2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

3. Submit certification that Special Inspection Agency is acceptable to DSA.

C. Testing Agency Qualifications: Prior to the start of work, the Testing Agency shall:

1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.

2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

3. Submit certification that Testing Agency is acceptable to DSA.

D. Fabricator Special Inspection Reports: After each special inspection of fabricated items at the Fabricator's facility, Special Inspector shall promptly submit two copies of report; one to Project Architect and one to DSA.

1. Include:

a. Date issued.

b. Project title and number.

c. Name of Special Inspector.

d. Date and time of special inspection.

e. Identification of fabricated item and specification section.

f. Location in the Project.

g. Results of special inspection.

h. Verification of fabrication and quality control procedures.

i. Conformance with Contract Documents.

j. Conformance to referenced standard(s).

E. Test Reports: After each test or inspection, promptly submit two copies of report; one to Project Architect and one to DSA.

1. Include:

a. Date issued.

b. Project title and number.

c. Name of inspector.

d. Date and time of sampling or inspection.

e. Identification of product and specifications section.

f. Location in the Project.

g. Type of test or inspection.

h. Date of test or inspection.

i. Results of test or inspection.

j. Conformance with Contract Documents.

F. Certificates: When specified in individual special inspection requirements, Special Inspector shall submit certification by the manufacturer, fabricator, and installation subcontractor to Project Architect and DSA, in quantities specified for Product Data.

1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

2. Certificates may be recent or previous test results on material or product, but must be acceptable to Project Architect and DSA.

G. Fabricator's Field Reports: Submit reports to Project Architect and DSA.

1. Submit report in duplicate within 30 days of observation to Project Architect for information.

2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.04 SPECIAL INSPECTION AGENCY

A. Glendale Unified School District or Project Architect will employ services of a Special Inspection Agency to perform inspections and associated testing and sampling required by the building code.

B. The Special Inspection Agency may employ and pay for services of an independent testing agency to perform testing and sampling associated with special inspections and required by the building code.

C. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.05 TESTING AND INSPECTION AGENCIES

A. Glendale Unified School District or Project Architect may employ services of an independent testing agency to perform additional testing and sampling associated with special inspections but not required by the building code.

B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS- NOT USED

PART 3 EXECUTION

3.01 SCHEDULE OF SPECIAL INSPECTIONS, GENERAL

A. Frequency of Special Inspections: Special Inspections in conformance with 2010 California Building Code, chapter 17A.

1. Continuous Special Inspection: Special Inspection Agency shall be present in the area where the work is being performed and observe the work at all times the work is in progress.

2. Periodic Special Inspection: Special Inspection Agency shall be present in the area where work is being performed and observe the work part-time or intermittently and at the completion of the work.

3. For required tests, see Schedule of Tests, Inspections and Methods, Sheets T-1, 1 and 2.

END OF SECTION

SECTION 01 53 50

PROTECTION OF INSTALLED WORK

PART 1-GENERAL

1.01 REQUIREMENTS INCLUDED

A. Protection for Products, including District - Provided Products, After Installation.

B. Protection of Existing Utilities and Interference.

1.02 EXISTING UTILITIES

A. The known existing utilities are shown on the drawings in their approximate location and the Prime Trade Contractor shall exercise care in avoiding damage to these facilities as the Prime Trade Contractor will be held responsible for their repair if damaged. Hand excavation shall be utilized when digging in close proximity to existing utilities. The District's Architectural Team does not guarantee that all utilities or obstructions are shown or that the locations indicated are accurate.

B. No work shall be performed on energized electrical equipment unless scheduled with the District Inspector of Record. The District Inspector of Record reserves the right to specify specific conditions for all work involving energized high voltage electrical equipment, and its scheduled modification proposal.

C. If interferences occur at locations other than the general locations shown on the plans, and such utilities are damaged before their locations have been established, or create an interference, the Prime Trade Contractor shall notify the District's Construction/Project Manager and a method for correcting said interference shall be supplied by the District's Engineering representatives. Payment for additional work due to interferences not shown on the plans shall be in accordance with the General Conditions.

D. Drawings showing location of equipment, piping, etc., are diagrammatic and job conditions will not always permit their installation in location shown. When this situation occurs, bring to the District Architect's, and/or Inspector's attention immediately to determine relocation in joint conference.

E. Information shown relative to existing power and signal service is based upon available records and data but shall be regarded as approximate only. Minor deviations found necessary to conform to actual locations and conditions shall be made without extra cost to the District.

PART 2- PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 PROTECTION AFTER INSTALLATION

A. Adequately protect all installed equipment and materials until completion and acceptance by the Architect, Inspector, and Project Manager.

B. Protect installed products and control traffic in immediate area to prevent damage in subsequent operations.

C. Provide protective coverings at walls, projections, corners, and jambs, sills, and stiff openings in and adjacent to traffic areas.

D. Cover walls and floors of elevator cabs, and jambs of cab doors, when elevators are used by construction personnel. Protect elevator area until final acceptance.

E. Protect finished floors and stairs from dirt, wear, and damage:

1. Secure heavy sheet goods or similar protective materials in place, in areas subject to construction foot traffic, and/or material deliveries.

2. Lay planking or similar rigid materials in place, in areas subject to movement of heavy objects over existing surfaces.

3. Lay planking or similar rigid materials in place in areas where storage of products will occur.

F. Protect waterproofed and roofed surfaces:

1. Restrict use of surfaces for traffic of any kind, and for storage of products.

2. When an activity is mandatory, obtain recommendations for protection of surface from manufacturer. Install protection and remove on completion of activity. Restrict use of adjacent unprotected areas.

G. Restrict traffic of any kind across planted lawn and landscape areas through the use of temporary barricades, fencing, signage, and until final acceptance and maintenance period.

H. Care shall be exercised to prevent damage to adjacent facilities including walks, curbs, and gutters, etc. Where equipment will pass over these obstructions, suitable planking and protection shall be placed, and damaged facilities, due to the Contractor(s) operations, shall be removed and replaced at the Prime Trade Contractor's expense.

I. Prime Trade Contractor shall be responsible for overloading of any part or parts of structures beyond their safe calculated carrying capacities by placing of materials, equipment, tools machinery or any other item thereon.

J. All existing improvements and facilities shall be protected from damage of any type resulting from the operations, equipment or workers of the Contractor(s) during the time the project.

K. All damaged work shall be replaced, repaired and restored to its original condition with no additional cost to the District.

L. Where existing utilities are damaged or disrupted on account of any act, omission, neglect or misconduct by the Contractors in the manner or method of executing the work, or due to non-execution of work, such damage shall be immediately repaired to maintain operation regardless of the time of occurrence with no cost to the District.

M. Provide temporary construction necessary for protection of the building and their parts. Close buildings as soon as possible as protection from the weather and vandalism. Protect existing buildings and controlled temperature areas from excessive temperature variances below 68 degrees Fahrenheit, and above 76 degrees Fahrenheit, and from any damage.

N. Protect doors, millwork and mill counters and cases and hardware from damage, including abrading and scratching of finishes.

O. Protect doors and frames and hardware from mechanical damage and damage to finish coatings.

P. Remove protective coatings, wrappings, temporary coverings, etc., as required to leave work in condition for painting and finishing, final cleaning, etc.

Q. Protect all exterior work, including existing asphalt paving, concrete flatwork, common sidewalk, and City curb, gutter, and aprons. Protect all existing and newly placed landscaping and irrigation systems.

R. Repair or replace all damaged work promptly as directed by District Construction/Project Manager, District IOR, or District Architect at no cost to the District.

END OF SECTION

SECTION 01 54 00

SECURITY

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Security Program.

B. Entry Control.

C. Personnel Identification.

D. Miscellaneous Restrictions

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 SECURITY PROGRAM

A. Protect work, existing premises, and School operations from theft, vandalism and unauthorized entry.

B. Security of the job area shall be strictly maintained. The Prime Trade Contractor shall be responsible for keeping areas involved in the work locked and secure at all times when work is not in progress, and no Contractor representative is on site.

3.02 ENTRY CONTROL

A. Restrict entrance of persons and vehicles into Project site and existing facilities under construction. Allow entrance only to authorized persons with proper identification, and appropriate footwear, and hard hats, as determined by the Contractor Project Safety Inspector, and/or District Inspector.

B. Prime Trade Contractor shall control entrance of own persons and vehicles related to construction operations in accordance with the conditions during work, and not allow intrusion by others.

3.03 BADGES AND ESCORT REQUIREMENTS

A. All personnel shall wear badges distinguishing personnel requiring an escort (YELLOW badges) to areas of the campus outside of the work area from those not requiring an escort (GREEN badges).

B. Personnel without fingerprint and acceptable background check on file with the District shall require an escort to any area outside of the work area.

C. The Contract and Pre-Construction meeting wording lays out the appropriate procedures for Contractor and Subcontractor personnel in working on the school site.

END OF SECTION

SECTION 01 56 40

ENVIRONMENTAL MITIGATION

PART 1-GENERAL

1.01 SECTION INCLUDES

A. The Environmental Mitigation requirement for this project is recorded in this specification section 01 56 40. The measures and mitigations may include, but are not limited to, procedures and standards to control:

1. Dust

2. Noise

3. Fumes

4. Timing of work activities

5. Erosion

6. Archaeological resources found during excavation

7. Preservation of trees

8. Demolition process and materials.

1.02 EXECUTION

A. The Contractor shall comply with the mitigation below in terms of what is to be controlled, acceptable methods, and standards (e.g. equipment must be muffled and noise levels may not exceed specified decibel levels).

B. The Contractor shall provide documentation of having met the mitigation requirements as described below to the Inspector and/or Project Manager within five (5) working days of the Notice to Proceed and at each phase of the project.

C. To reduce dust emissions and noise during construction by implementing the following:

1. Exposed surfaces should be watered twice daily.

2. Stockpiles of excavated materials should be covered.

3. Trucks carrying excavated materials from the site should be covered and should have their tires and undercarriages washed prior to exiting the site.

4. Streets affected by fugitive sand and dust are to be swept regularly by Prime Trade Contractors responsible for tracking of mud and/or sand to these streets.

5. Uncovered soil should be bound (by grass or similar groundcover) as soon as is reasonably possible.

6. Excavation should not be conducted when surface winds exceed 11 mph.

7. Unnecessary idling of construction vehicles and equipment should be avoided adjacent to areas of instruction, or adjacent to fresh air ductwork, or where noise will affect the areas of instruction.

8. Limit construction activities to a schedule that minimizes disruption as much as possible to area residences surrounding the project site property boundaries.

9. Schedule activities with the highest noise potential for the times when disruption of any instruction, or area of residences surrounding the project site will be at a minimum.

10. Require contractors to employ the lowest-decibel level equipment, or employ alternative equipment or to muffle/control noise from available equipment to the maximum extent possible.

11. Perform noisy operations (e.g., mixing concrete, hydraulic/mechanical demolition) off-site or on portions of the site furthest from noise sensitive receptors whenever possible, and in consult with the Inspector and/or Project Manager.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations and procedures.

F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 SUBMITIALS

A. Proposed Products List: Submit list tabulated by Section Number of major products proposed for use, with name of manufacturer, trade name, and model number of each product. Indicate which products are being proposed as substitutions.

1. Submit within 15 days after date of Notice to Proceed.

2. For products specified only by reference standards, list applicable reference standards.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Glendale Unified School District, or otherwise indicated as to remain the property of the Glendale Unified School District, become the property of the Contractor; remove from site.

B. Overall Project Requirement: Use reused products for at least 50 percent of all products used on project as required by The California Green Building Standards Code, Section 5.408.3.

1. This provision is applicable to LEED Credits MR 3.1 and 3.2; show quantity on LEED report.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. Do not use products having any of the following characteristics:

1. Made using or containing CFC's or HCFC's.
2. Made of wood from newly cut old growth timber.

C. Where all other criteria are met, Contractor shall give preference to products that:

1. Are extracted, harvested, and/or manufactured closer to the location of the project.
2. Have longer documented life span under normal use.
3. Result in less construction waste.
4. Are made of vegetable materials that are rapidly renewable.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Glendale Unified School District; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. Project Architect will consider requests for substitutions only within 15 days after date of Agreement.

B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

D. A request for substitution constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
2. Will provide the same warranty for the substitution as for the specified product.
3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Glendale Unified School District.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Will reimburse Glendale Unified School District and Project Architect for review or redesign services associated with re-approval by authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:

1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.

2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.

3. The Project Architect will notify Contractor in writing of decision to accept or reject request.

3.02 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Pre-installation meetings.

C. Cutting and patching.

D. Surveying for laying out the work.

E. Cleaning and protection.

F. Starting of systems and equipment.

G. Demonstration and instruction of Glendale Unified School District personnel.

H. Closeout procedures, except payment procedures.

I. General requirements for maintenance service, and 11th Month Warranty Walk.

1.02 SUBMITTALS

A. See Section 01 33 13 - Submittal Procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.

1. On request, submit documentation verifying accuracy of survey work.

2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.

3. Submit surveys and survey logs for the project record.

1.03 QUALIFICATIONS

A. For survey work, employ a land surveyor registered in California and acceptable to Project Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.

B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in California.

C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in California.

1.04 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

E. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.

F. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation. Follow all BMPs as indicated in the approved SWPPP.

1. Minimize amount of bare soil exposed at one time.
2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

G. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

1. Outdoors: Limit conduct of especially noisy exterior work to the hours of 7 AM to 7 PM.

H. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.05 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Glendale Unified School District occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Glendale Unified School District's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for

patching and extending work.

B. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Project Architect five working days in advance of meeting date.

D. Prepare agenda and preside at meeting:

1. Review conditions of examination, preparation and installation procedures.

2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Project Architect, Glendale Unified School District, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Project Architect of any discrepancies discovered.

C. Contractor shall locate and protect survey control and reference points.

D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

E. Promptly report to Project Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Project Architect.

G. Utilize recognized engineering survey practices.

H. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

I. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
2. Grid or axis for structures.
3. Building foundation, column locations, ground floor elevations.

J. Periodically verify layouts by same means.

K. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:

1. Complete the work.
2. Fit products together to integrate with other work.
3. Provide openings for penetration of mechanical, electrical, and other services.
4. Match work that has been cut to adjacent work.
5. Repair areas adjacent to cuts to required condition.
6. Repair new work damaged by subsequent work.
7. Remove samples of installed work for testing when requested.

8. Remove and replace defective and non-conforming work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.

I. Patching:

1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

2. Match color, texture, and appearance.

3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.07 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.08 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material

manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.09 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

F. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.

G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION

A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months, arranged through the FASO Supervisor of the Project Site at (818) 242-0003, with a minimum of five (5) working days advanced notice.

C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.

D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Glendale Unified School District's personnel in detail to explain all aspects of operation and maintenance.

E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

F. The amount of time required for instruction on each item of equipment and system is that specified in individual sections, but no less than 2-hours for maintenance technicians.

3.11 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.12 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

E. Clean or replace filters of operating equipment.

F. Clean debris from roofs, gutters, downspouts, and drainage systems.

G. Clean site; sweep paved areas, rake clean landscaped surfaces.

H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

1. Provide copies to Project Architect.

B. Notify Project Architect when work is considered ready for Substantial Completion.

C. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Project Architect's review.

D. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Glendale Unified School District-occupied areas.

E. Notify Project Architect when work is considered finally complete.

F. Complete items of work determined by Project Architect's final inspection.

FINAL PAYMENT APPLICATION warrant will not be released until As-Built

drawings are received and accepted by the Architect.

NOTE: Check that this is consistent with current Contract Doc's before inclusion!!

3.14 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

NOTE: at or about the 11th Month after Beneficial Occupancy, Prime Contractor(s) shall make themselves available to meet with the Director of Facility and Support Operations (FASO), and the Architect, to walk the site for any warranty items that may be outstanding. During this walk, the Architect and/or Director of FASO (or his/her designee) will note any items that need contractor, or subcontractor attention as a part of the Warranties and Maintenance of the project.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Glendale Unified School District.

END OF SECTION

SECTION 01 74 10

CLEANING

PART 1 - GENERAL

1.01 SECTION INCLUDES.

A. Maintain premises and adjacent public and private properties free from accumulations of waste, debris, and rubbish, caused by operations during the project.

B. At completion of Work, remove waste materials rubbish, tools, equipment, machinery and surplus materials, and clean all exposed surfaces; leave project clean and ready for occupancy.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Use only cleaning materials recommended by the manufacturer of surface to be cleaned.

B. Use cleaning materials only on proper surfaces recommended by the manufacturer.

PART 3 - EXECUTION

3.01 DURING CONSTRUCTION:

A. Execute daily cleaning plans from each trade to ensure that buildings, grounds, and public and private properties are maintained free from accumulations of waste materials, rubbish and trash on a daily basis.

B. Wet down dry materials and rubbish to prevent blowing dust and debris on and from the construction work.

C. Daily, during progress of work, clean construction site and utilized public properties, and dispose of waste materials, debris and rubbish.

D. Provide on-site steel dump containers and appropriately sized trash containers for collection of waste materials, debris and rubbish. DO NOT USE SITE CONTAINERS.

E. Remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas off the District's property.

F. Vacuum clean and wet wipe interior building walls, floors, doors, windows, and hardware in preparation for and when ready to receive finish preparation and painting. Continue vacuum cleaning on an as-needed basis until building is ready final inspection by the Architect, Inspector, and Project Manager and determined to be ready for substantial completion and occupancy.

G. Handle materials in a controlled manner to minimize any unnecessary waste or debris emanating from the construction areas. Do not drop or throw materials from heights: rather, a closed chute shall be used, to minimize unnecessary dust, waste or debris from the construction area.

H. Schedule cleaning operations so that dust and other contaminants resulting from cleaning

process will not migrate into new equipment or furniture, or onto wet, newly painted, or finished surfaces.

3.02 FINAL CLEANING:

A. Employ experienced workmen, or professional cleaners, for final cleaning.

B. Exterior: Clean surfaces of the construction and site including, but not limited to, fixtures, walls, soffits, floors, hardware, roofs, window and opening ledges and sills, horizontal projections, steps and platforms, walkways, rails and all like surfaces, and adjoining private and public property to the extent soiled by the Contractor's operations.

C. Interior: Leave all horizontal and vertical surfaces in vacuum cleaned, wet-wiped condition with all dust, dirt, stains, hand marks, paint spots, droppings, and other blemishes and defects completely removed, and conform to the following requirements:

1. Hard Floors: Freshly administer specified product sealants, and Wet mop/wash and dry, concrete, portland cement flooring, tile, elastomeric, epoxy, refinished and colored concrete, and similar hard floor surfaces free of dust, streaks or stains.

2. Resilient Flooring: Freshly wax and buff as specified in Section 09 65 00.

3. Wood Flooring: Remove defects and blemishes by sanding surface and painting according to Section 09 90 00.

4. Resilient Bases: Clean off adhesive smears and wipe clean with wet-wipe methods.

5. Unpainted and Painted Surfaces: Clean of dust, lint, streaks or stains, utilizing wet-wipe methods as necessary.

6. Tile Walls: Clean and polish per manufacturer's specifications.

7. Hardware and Metal Surfaces: Clean and polish all exposed surfaces using non-corrosive and nonabrasive materials.

8. Glass: Wash and polish both sides, and leave free of dirt, spots, streaks, and labels. Clean and polish mirrors.

9. Ceilings: Clean and free of stains, hand marks, and defacing.

10. Replace air conditioning filters as specified in Mechanical Specifications.

11. Clean ducts, blowers and coils, if air conditioning units are found to have been operated without filters during construction, and after final inspection.

12. Lighting fixtures: Replace lamps and clean fixtures and lenses if fixtures or lamps are dirty or have smudges or dust.

13. Fixtures and Equipment: Clean and polish mechanical and electrical fixtures and like items. Leave lighting fixtures free of dust, dirt, stains or waste material. Clean and service equipment and machinery, leaving ready for use.

14. Surfaces Not Mentioned: Clean according to the intent of this Section and as

required for Architect's approval.

D. Contaminated Earth: Final clean up operation includes the removal and disposal of earth that is contaminated or unsuitable for support of plant life in planting areas, and filling the resulting excavations with suitable soil as directed and approved by the Architect, Inspector, and/or Project Manager.

Contaminated areas include those used for disposal of waste concrete, mortar, plaster, masonry, paints, and similar materials, and areas in which washing out of concrete and plaster mixers or washing of tools and like cleaning operations have been performed, and all areas and adjacent areas that have been oiled, paved, or chemically treated.

Do not dispose of waste, oil, solvents, paints, solutions, or like penetrating material by depositing or burying on School property; dispose of such material in a lawful manner.

SECTION 01 77 50

OPERATION AND MAINTENANCE DATA-TRAINING OF OWNER'S PERSONNEL

PART 1 - GENERAL

1.01 SECTION INCLUDES.

A. Assembly and submission of operating and maintenance data and manuals.

B. Submission of preliminary draft of final data and manuals.

C. Instruction of Owner's personnel in operation, adjustment and maintenance of products, equipment and systems.

1.02 MANUALS:

A. General: Where manuals are required to be submitted covering items included in this Work prepare all such manuals in durable plastic 3-ring binders no less than 8-1/2 by 11 inches in size and with at least the following:

1. Identification on, or readable through, the front cover stating general nature of the manual;

2. Neatly typewritten index near the front of the manual, furnishing immediate information as to location in the manual of all data;

3. Copy of all guarantees and warrantees issued.

B. Maintenance and operation instructions:

1. Procure or prepare and include in manuals, operating and/or maintenance instruction for all equipment and/or materials that will require any adjustment, servicing, or attention for its proper operation or use.

2. These instructions shall set forth all of the information necessary for the District to operate and make full and efficient use and perform such maintenance and servicing, as would ordinarily be done by the District or maintenance personnel.

3. Write instructions in simple, non-technical language when possible, with sufficient diagrams and explanation where necessary to be readily understandable by average layman. Possible hazards shall be particularly pointed out with instruction cautioning against mistakes that might result in damage or danger to equipment, building, or personnel.

C. Extraneous data: Where contents of manuals include manufacturer's catalog pages, clearly indicate the precise items included in this installation and delete or otherwise clearly indicate all manufacturer's data with which this installation is not concerned.

1.03 MANUAL CONTENT:

A. Neatly typewritten table of contents for each volume, arrange in systematic order.

B. List:

1. Contractor, name of responsible principal, address, telephone number, and email address of the company contact.

2. Each product including name, telephone number, and email address of:

    a. Subcontractor or installer.

    b. Recommended maintenance contractor.

    c. Local source for replacement parts (within 50 mile radius of site).

3. Product name and other identifying symbols set forth in Contract Documents.

4. Product Data:

    a. Include only those sheets which are pertinent to specific product.

    b. Annotate each sheet to:

        1) Clearly identify specific product or part installed.

        2) Clearly identify data applicable to installation.

        3) Delete references to inapplicable data.

5. Drawings:

    a. Supplement product data with drawings where necessary to clearly illustrate:

        1) Relations of component parts.

        2) Control and flow diagrams.

    b. Do not use "Project Record Documents" as maintenance drawings.

6. Written Test:

    a. Provide where necessary to supplement Product Data and drawings.

    b. Organize in consistent format under separate headings for different procedures.

    c. Provide logical sequence of instruction for each procedure.

7. Warranties, Bonds, and Maintenance Contracts:

    a. Provide copies of each of the following:

        1) Proper procedures in event of failure.

        2) Instances which might affect validity of warranties, bonds, or contracts.

1.04 MANUAL FOR ARCHITECTURAL MATERIALS AND FINISHES:

A. Include the following manufacturer's data:

1. Catalog number, size, composition.
2. Color and texture designations.
3. Required reordering information.
4. Recommend cleaning materials and methods.
5. Cautions against detrimental cleaning materials and methods.
6. Recommend cleaning and maintenance schedule.

B. Submit specified information for the following:

1. Irrigation System: Section 32 80 00.
2. Landscaping: Section 32 01 90.
3. Finish Hardware: Section 08 71 00.
4. Resilient Flooring: Section 09 65 00.
5. Marker boards: Section 10 11 01.
6. Toilet Compartments: Section 10 21 13.
7. Fire Extinguishers: Section 10 44 00.
8. Projection Screens: Section 11 52 13.
9. Athletic Equipment.Gym: Section 11 65 00
10. Window Coverings: Section 12 21 16.
11. Special Construction: Division 13 et seq
12. Plumbing Fixtures: Division 22 et seq
13. HVAC Equipment: Division 23 et seq
14. Electrical Equipment/Fixtures: Division 26 et seq
15. Conveying Equipment: Division 14
16. As specified in Divisions 06; 08; 09;10; 11; 12.

1.05 MANUAL FOR ROOFING MATERIALS

A. Include the following manufacturer's data:

1. Instructions for inspection, maintenance and repair.

1.06 MANUAL FOR MECHANICAL EQUIPMENT AND SYSTEMS

A. Include the following manufacturer's data:

1. Function, normal operating characteristics, and limiting conditions.

2. Performance curves, engineering data, and tests.

3. Complete nomenclature and commercial number of replaceable parts.

B. Operating procedures including:

1. Start-up, break-in routine, and normal operating instructions.

2. Regulations, control, stopping, shut-down, and emergency instructions.

3. Summer and winter operating instructions.

4. Special operating instructions.

C. Maintenance procedures including:

1. Routing operations.

2. Trouble shooting guide

3. Disassembly, repair, and reassemble.

4. Alignment, adjusting, and checking.

5. Servicing and lubricating schedule, including recommended lubricants.

D. Manufacturer's printed operating and maintenance instructions.

E. Control system operation sequences.

F. Parts list, illustrations, assembly drawings, and diagrams necessary for maintenance including:

1. Life expectancy of parts subject to wear.

2. Items recommended to be stocked as spare parts.

G. As-installed control systems diagrams.

H. Color-code legend, if any.

I. Valve tag number chart, with location and function of each valve, in typewritten format, clearly indicating location on a room, area, or building diagram in sufficient size to readily identify the item.

J. Submit specified information for the following; Mechanical equipment specified in the Mechanical Equipment schedules and Specifications.

1.07 MANUAL FOR ELECTRICAL EQUIPMENT AND SYSTEMS

A. Include the following manufacturer's data:

1. Description of unit and component parts including:

    a. Function, normal operating characteristics and limiting conditions.

    b. Performance curve, engineering data and tests.

    c. Complete nomenclature and commercial number of replaceable parts.

2. Panel board circuit directories indicating:

    a. Electrical service.

    b. Controls.

    c. Communications, if any.

3. As-installed wiring color-code legend, if any.

4. Operating procedures including:

    a. Routine and normal operating instructions.

    b. Sequences required.

    c. Special operating instructions.

5. Maintenance procedures, including:

    a. Routine operations.

    b. Trouble-shooting guide.

    c. Disassembly, repair, and reassembly.

    d. Adjustment and checking.

6. Manufacturer's printed operating and maintenance instructions.

7. Parts list, including current prices, and recommended spare parts to be maintained in storage.

B. Submit specified information for the following:

1. Electrical equipment specified in Mechanical and Electrical Equipment Schedules and Specifications.

1.08 ADDITIONAL DATA

A. Prepare and include the following:

1. Additional data when need becomes apparent during instruction of District's personnel.

2. Additional data specified in other Sections of Specifications to be included.

1.09 SUBMITTAL SCHEDULE

A. Preliminary Draft:

1. Submit two copies of the proposed format, approximately fifteen (15) days before substantial completion to the Architect and Inspector and/or Project Manager for review and comments.

2. Architect and Inspector will review, and return one copy with any comments.

B. Final Submittal:

1. Submit, in final form, one copy of complete data seven (7) days prior to final inspection. Copy will be returned with comments.

2. Submit four (4) copies in approved final form prior to final inspection and acceptance, and occupancy.

1.10 INSTRUCTION OF OWNER'S PERSONNEL

A. Prior to Substantial Completion, instruct District's personnel in necessary operation, adjustment, and maintenance of products, equipment and systems. District's personnel will consist of on-site School site personnel laypersons; Facility and Support Operations maintenance technicians; other District personnel. Instruction sessions as outlined in each Section will be at a time and date convenient and pre-approved by the District Project Manager. The District will be reasonable in the fact that instruction sessions will be during normal working hours, Monday through Friday, unless training would interrupt the instructional process.

B. Operating and Maintenance Manuals, as well as knowledgeable installer(s) shall conduct the instruction, which SHALL BE Electronically audio/visually recorded by the contractor, to constitute basis of instruction, and a DVD of the instruction transmitted to the District.

C. Review manual contents with District's personnel in detail to explain all aspects of operations and maintenance, and conduct hands-on demonstrations where appropriate, and conduct a question and answer session before the end of the training session. Training sessions will be as long as necessary to satisfy the personnel in attendance.

D. A listing of all personnel receiving instructions, complete with a sign-in sheet indicating the printed name, and the signature of those attending, dates and times of instruction, and pertinent data regarding the training specific equipment or system, shall be transmitted to the Architect or Project Manager upon completion of instruction session(s).

E. The District's designated Facility and Support Operations (FASO) Representative(s) will be instructed as to the proper operations of all environmental equipment and fire and life safety, and security systems prior to Substantial Completion and Occupancy of a project phase or building, or building area. This instruction will be provided to the District's FASO and School Site personnel with the basic working knowledge of all equipment, and systems. Specific programming instruction shall be provided the District's FASO technicians as deemed necessary by the District for use of the system or equipment.

F. Contractor shall perform all testing, adjusting, etc., as outlined in the specifications and/or as recommended by the manufacturer.

G. **All HVAC equipment shall be operated a minimum of two (2) weeks or no less than 80 hours, with District specified MERV 8 or higher rating pleated filters, prior to Substantial Completion approval**.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION - NOT APPLICABLE

END OF SECTION

SECTION 01 77 50

OPERATION AND MAINTENANCE DATA-TRAINING OF OWNER'S PERSONNEL

PART 1 - GENERAL

1.01 SECTION INCLUDES.

A. Assembly and submission of operating and maintenance data and manuals.

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C. Instruction of Owner's personnel in operation, adjustment and maintenance of products, equipment and systems.

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1. Identification on, or readable through, the front cover stating general nature of the manual;

2. Neatly typewritten index near the front of the manual, furnishing immediate information as to location in the manual of all data;

3. Copy of all guarantees and warrantees issued.

B. Maintenance and operation instructions:

1. Procure or prepare and include in manuals, operating and/or maintenance instruction for all equipment and/or materials that will require any adjustment, servicing, or attention for its proper operation or use.

2. These instructions shall set forth all of the information necessary for the District to operate and make full and efficient use and perform such maintenance and servicing, as would ordinarily be done by the District or maintenance personnel.

3. Write instructions in simple, non-technical language when possible, with sufficient diagrams and explanation where necessary to be readily understandable by average layman. Possible hazards shall be particularly pointed out with instruction cautioning against mistakes that might result in damage or danger to equipment, building, or personnel.

C. Extraneous data: Where contents of manuals include manufacturer's catalog pages, clearly indicate the precise items included in this installation and delete or otherwise clearly indicate all manufacturer's data with which this installation is not concerned.

1.03 MANUAL CONTENT:

A. Neatly typewritten table of contents for each volume, arrange in systematic order.

B. List:

1. Contractor, name of responsible principal, address, telephone number, and email address of the company contact.

2. Each product including name, telephone number, and email address of:

    a. Subcontractor or installer.

    b. Recommended maintenance contractor.

    c. Local source for replacement parts (within 50 mile radius of site).

3. Product name and other identifying symbols set forth in Contract Documents.

4. Product Data:

    a. Include only those sheets which are pertinent to specific product.

    b. Annotate each sheet to:

        1) Clearly identify specific product or part installed.

        2) Clearly identify data applicable to installation.

        3) Delete references to inapplicable data.

5. Drawings:

    a. Supplement product data with drawings where necessary to clearly illustrate:

        1) Relations of component parts.

        2) Control and flow diagrams.

    b. Do not use "Project Record Documents" as maintenance drawings.

6. Written Test:

    a. Provide where necessary to supplement Product Data and drawings.

    b. Organize in consistent format under separate headings for different procedures.

    c. Provide logical sequence of instruction for each procedure.

7. Warranties, Bonds, and Maintenance Contracts:

    a. Provide copies of each of the following:

        1) Proper procedures in event of failure.

        2) Instances which might affect validity of warranties, bonds, or contracts.

1.04 MANUAL FOR ARCHITECTURAL MATERIALS AND FINISHES:

A. Include the following manufacturer's data:

1. Catalog number, size, composition.
2. Color and texture designations.
3. Required reordering information.
4. Recommend cleaning materials and methods.
5. Cautions against detrimental cleaning materials and methods.
6. Recommend cleaning and maintenance schedule.

B. Submit specified information for the following:

1. Irrigation System: Section 32 80 00.
2. Landscaping: Section 32 01 90.
3. Finish Hardware: Section 08 71 00.
4. Resilient Flooring: Section 09 65 00.
5. Marker boards: Section 10 11 01.
6. Toilet Compartments: Section 10 21 13.
7. Fire Extinguishers: Section 10 44 00.
8. Projection Screens: Section 11 52 13.
9. Athletic Equipment.Gym: Section 11 65 00
10. Window Coverings: Section 12 21 16.
11. Special Construction: Division 13 et seq
12. Plumbing Fixtures: Division 22 et seq
13. HVAC Equipment: Division 23 et seq
14. Electrical Equipment/Fixtures: Division 26 et seq
15. Conveying Equipment: Division 14
16. As specified in Divisions 06; 08; 09;10; 11; 12.

1.05 MANUAL FOR ROOFING MATERIALS

A. Include the following manufacturer's data:

1. Instructions for inspection, maintenance and repair.

1.06 MANUAL FOR MECHANICAL EQUIPMENT AND SYSTEMS

A. Include the following manufacturer's data:

1. Function, normal operating characteristics, and limiting conditions.

2. Performance curves, engineering data, and tests.

3. Complete nomenclature and commercial number of replaceable parts.

B. Operating procedures including:

1. Start-up, break-in routine, and normal operating instructions.

2. Regulations, control, stopping, shut-down, and emergency instructions.

3. Summer and winter operating instructions.

4. Special operating instructions.

C. Maintenance procedures including:

1. Routing operations.

2. Trouble shooting guide

3. Disassembly, repair, and reassemble.

4. Alignment, adjusting, and checking.

5. Servicing and lubricating schedule, including recommended lubricants.

D. Manufacturer's printed operating and maintenance instructions.

E. Control system operation sequences.

F. Parts list, illustrations, assembly drawings, and diagrams necessary for maintenance including:

1. Life expectancy of parts subject to wear.

2. Items recommended to be stocked as spare parts.

G. As-installed control systems diagrams.

H. Color-code legend, if any.

I. Valve tag number chart, with location and function of each valve, in typewritten format, clearly indicating location on a room, area, or building diagram in sufficient size to readily identify the item.

J. Submit specified information for the following; Mechanical equipment specified in the Mechanical Equipment schedules and Specifications.

1.07 MANUAL FOR ELECTRICAL EQUIPMENT AND SYSTEMS

A. Include the following manufacturer's data:

1. Description of unit and component parts including:

   a. Function, normal operating characteristics and limiting conditions.

   b. Performance curve, engineering data and tests.

   c. Complete nomenclature and commercial number of replaceable parts.

2. Panel board circuit directories indicating:

   a. Electrical service.

   b. Controls.

   c. Communications, if any.

3. As-installed wiring color-code legend, if any.

4. Operating procedures including:

   a. Routine and normal operating instructions.

   b. Sequences required.

   c. Special operating instructions.

5. Maintenance procedures, including:

   a. Routine operations.

   b. Trouble-shooting guide.

   c. Disassembly, repair, and reassembly.

   d. Adjustment and checking.

6. Manufacturer's printed operating and maintenance instructions.

7. Parts list, including current prices, and recommended spare parts to be maintained in storage.

B. Submit specified information for the following:

1. Electrical equipment specified in Mechanical and Electrical Equipment Schedules and Specifications.

1.08 ADDITIONAL DATA

A. Prepare and include the following:

1. Additional data when need becomes apparent during instruction of District's personnel.

2. Additional data specified in other Sections of Specifications to be included.

1.09 SUBMITTAL SCHEDULE

A. Preliminary Draft:

1. Submit two copies of the proposed format, approximately fifteen (15) days before substantial completion to the Architect and Inspector and/or Project Manager for review and comments.

2. Architect and Inspector will review, and return one copy with any comments.

B. Final Submittal:

1. Submit, in final form, one copy of complete data seven (7) days prior to final inspection. Copy will be returned with comments.

2. Submit four (4) copies in approved final form prior to final inspection and acceptance, and occupancy.

1.10 INSTRUCTION OF OWNER'S PERSONNEL

A. Prior to Substantial Completion, instruct District's personnel in necessary operation, adjustment, and maintenance of products, equipment and systems. District's personnel will consist of on-site School site personnel laypersons; Facility and Support Operations maintenance technicians; other District personnel. Instruction sessions as outlined in each Section will be at a time and date convenient and pre-approved by the District Project Manager. The District will be reasonable in the fact that instruction sessions will be during normal working hours, Monday through Friday, unless training would interrupt the instructional process.

B. Operating and Maintenance Manuals, as well as knowledgeable installer(s) shall conduct the instruction, which SHALL BE Electronically audio/visually recorded by the contractor, to constitute basis of instruction, and a DVD of the instruction transmitted to the District.

C. Review manual contents with District's personnel in detail to explain all aspects of operations and maintenance, and conduct hands-on demonstrations where appropriate, and conduct a question and answer session before the end of the training session. Training sessions will be as long as necessary to satisfy the personnel in attendance.

D. A listing of all personnel receiving instructions, complete with a sign-in sheet indicating the printed name, and the signature of those attending, dates and times of instruction, and pertinent data regarding the training specific equipment or system, shall be transmitted to the Architect or Project Manager upon completion of instruction session(s).

E. The District's designated Facility and Support Operations (FASO) Representative(s) will be instructed as to the proper operations of all environmental equipment and fire and life safety, and security systems prior to Substantial Completion and Occupancy of a project phase or building, or building area. This instruction will be provided to the District's FASO and School Site personnel with the basic working knowledge of all equipment, and systems. Specific programming instruction shall be provided the District's FASO technicians as deemed necessary by the District for use of the system or equipment.

F. Contractor shall perform all testing, adjusting, etc., as outlined in the specifications and/or as recommended by the manufacturer.

G. **All HVAC equipment shall be operated a minimum of two (2) weeks or no less than 80 hours, with District specified MERV 8 or higher rating pleated filters, prior to Substantial Completion approval**.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION - NOT APPLICABLE

END OF SECTION

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 SUBMITTALS

A. Project Record Documents: Submit documents to Project Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:

1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Project Architect will review draft and return one copy with comments.

2. For equipment, or component parts of equipment put into service during construction and operated by Glendale Unified School District, submit completed documents within ten days after acceptance.

3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Project Architect comments. Revise content of all document sets as required prior to final submission.

4. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:

1. For equipment or component parts of equipment put into service during construction with Glendale Unified School District's permission, submit documents within 10 days after acceptance.

2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.

3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS- NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.

2. Specifications.

3. Addenda.

4. Change Orders and other modifications to the Contract.

5. Reviewed shop drawings, product data, and samples.

B. Ensure entries are complete and accurate, enabling future reference by Glendale Unified School District.

C. Obtain Inspector of Record approval on documents.

D. Store record documents separate from documents used for construction.

E. Record information concurrent with construction progress.

F. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:

1. Manufacturer's name and product model and number.

2. Product substitutions or alternates utilized.

3. Changes made by Addenda and modifications.

G. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:

1. Measured depths of foundations in relation to finish first floor datum.

2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.

4. Field changes of dimension and detail.

5. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

1. Product data, with catalog number, size, composition, and color and texture designations.

2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional information as specified in individual product specification sections.

E. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:

1. Description of unit or system, and component parts.
2. Identify function, normal operating characteristics, and limiting conditions.
3. Include performance curves, with engineering data and tests.
4. Complete nomenclature and model number of replaceable parts.

B. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

C. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

D. Provide servicing and lubrication schedule, and list of lubricants required.

E. Include manufacturer's printed operation and maintenance instructions.

F. Include sequence of operation by controls manufacturer.

G. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

H. Provide control diagrams by controls manufacturer as installed.

I. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

J. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

K. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

L. Include test and balancing reports.

M. Additional Requirements: As specified in individual product specification sections.

3.05 OPERATION AND MAINTENANCE MANUALS

A. Comply with requirements contained in specific Sections for quantity of O&M manuals and operational data.

B. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

C. Prepare data in the form of an instructional manual.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Glendale Unified School District's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.

F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION

SECTION 03 01 30 - MAINTENANCE OF CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Removal of deteriorated concrete and reinforcement and subsequent replacement and patching.
2. Floor joint repair.
3. Epoxy crack injection.
4. Corrosion-inhibiting treatment.
5. Polymer overlays.
6. Polymer sealers.
7. Steel structural reinforcement.
8. Composite structural reinforcement.

B. Related Sections include the following:

1. Section 03 10 00 - Concrete Forms and Accessories
2. Section 03 30 00 - Cast-in-place Concrete
3. Section 07 19 00 - Water Repellents

1.3 UNIT PRICES

A. Unit prices include the cost of preparing existing construction to receive the work indicated and costs of field quality-control testing required by the Work for which the unit price applies.

B. Concrete Removal and Replacement or Patching: Work will be paid for by the cubic foot computed on the basis of rectangular solid shapes approximating the actual shape of concrete removed and replaced with average depths, widths, and lengths, measured to the nearest inch.

1. Reinforcing bar replacement will be paid for separately by the pound of replacement steel with welded and mechanical splices paid for by the unit.

C. Epoxy Crack Injection: Work will be paid for by the linear foot of crack injected.

D. Polymer Overlays: Work will be paid for by the square foot of exposed overlay surface.

E. Composite Structural Reinforcement: Work will be paid for by the square foot of composite material applied.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include material descriptions, chemical composition, physical properties, test data, and mixing, preparation, and application instructions.

B. Formwork Drawings: Prepared by or under the supervision of a qualified professional engineer detailing formwork. Include schedule and sequence for erection and removal relative to removal of deteriorated concrete and reinforcement and subsequent repair and reinforcement.

C. Samples: Cured Samples of overlay and patching materials.

D. Qualification Data: For installers and manufacturers.

1. For products required to be installed by workers approved by product manufacturers, include letters of acceptance by product manufacturers certifying that installers are approved to apply their products.

E. Material Certificates: For each type of product indicated, signed by manufacturers.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for bonding agents, patching mortars, epoxy adhesives and composite structural reinforcement.

G. Rehabilitation Program: For each phase of rehabilitation process, including protection of surrounding materials and Project site during operations. Describe in detail materials, methods, equipment, and sequence of operations to be used for each phase of the Work.

1. If alternative materials and methods to those indicated are proposed for any phase of rehabilitation work, submit substitution request complying with Section 01 60 00 Product Requirements and provide a written description of proposed materials and methods, including evidence of successful use on other comparable projects, and a testing program to demonstrate their effectiveness for this Project.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Installer that employ workers trained and approved by manufacturer to apply corrosion-inhibiting treatments, concrete patching and rebuilding materials, epoxy crack injection materials, polymer overlays, polymer sealers, and composite structural reinforcement.

B. Manufacturer Qualifications: Manufacturer that employs factory-trained representatives who are available for consultation and Project-site inspection.

C. Source Limitations: Obtain concrete patching and rebuilding materials, epoxy crack injection materials, and composite structural reinforcement materials through one source from a single manufacturer.

D. Mockups: Build mockups for concrete removal and patching, floor joint repair, epoxy crack injection, polymer overlays, polymer sealers and composite structural reinforcement to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 Project Management and Coordination.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original and unopened containers, labeled with type and name of products and manufacturers.

B. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.

C. Store cementitious materials off the ground, under cover, and in a dry location.

D. Store aggregates, covered and in a dry location, where grading and other required characteristics can be maintained and contamination avoided.

1.7 PROJECT CONDITIONS

A. Environmental Limitations for Epoxies: Do not apply when air and substrate temperatures are outside limits permitted by manufacturer. During hot weather, cool epoxy components before mixing, store mixed products in shade, and cool unused mixed products to retard setting. Do not apply to wet substrates unless approved by manufacturer.

1. Use only Class A epoxies when substrate temperatures are below or are expected to go below 40 deg F within 8 hours.
2. Use only Class A or B epoxies when substrate temperatures are below or are expected to go below 60 deg F within 8 hours.
3. Use only Class C epoxies when substrate temperatures are above and are expected to stay above 60 deg F for 8 hours.

B. Cold-Weather Requirements for Cementitious Materials: Do not apply unless air temperature is above 40 deg F and will remain so for at least 48 hours after completion of Work.

C. Cold-Weather Requirements for Cementitious Materials: Comply with the following procedures:

1. When air temperature is below 40 deg F, heat patching material ingredients and existing concrete to produce temperatures between 40 and 90 deg F.
2. When mean daily air temperature is between 25 and 40 deg F, cover completed Work with weather-resistant insulating blankets for 48 hours after repair or provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for 48 hours after repair.
3. When mean daily air temperature is below 25 deg F, provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for 48 hours after repair.

D. Hot-Weather Requirements for Cementitious Materials: Protect repair work when temperature and humidity conditions produce excessive evaporation of water from patching materials. Provide artificial shade and wind breaks, and use cooled materials as required. Do not apply to substrates with temperatures of 90 deg F and above.

E. Environmental Limitations for High-Molecular-Weight Methacrylate Sealers: Do not apply when concrete surface temperature is below 55 deg F or above 90 deg F. Apply only to substrates that have been dry for at least 72 hours.

PART 2 - PRODUCTS

2.1 BONDING AGENTS

A. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent: Product that consists of water-insensitive epoxy adhesive, portland cement, and water-based solution of corrosion-inhibiting chemicals that forms a protective film on steel reinforcement.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

   a. Euclid Chemical Company (The); Corr-Bond.
   b. Kaufman Products, Inc; Surepoxy HM EPL.

c. Sika Corporation; Armatec 110 EpoCem.
d. Sonneborn, Div. of ChemRex; Sonoprep.
e. Sto Corp., Concrete Restoration Division; Sto Bonding and Anti-Corrosion Agent.
f. Tamms Industries, Inc.; Duralprep A.C.

B. Epoxy Bonding Agent: ASTM C 881/C 881M.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. Anti-Hydro International, Inc.; Poly-Epoxy Bonding #100.
b. ChemCo Systems; CCS Bonder Liquid.
c. Dayton Superior Corporation.
d. Euclid Chemical Company (The).
e. Kaufman Products, Inc.; SurePoxy HM EPL.
f. MBT Protection and Repair, Div. of ChemRex; Concresive Liquid LPL.
g. Meadows, W. R., Inc.
h. Sika Corporation.
i. Sonneborn, Div. of ChemRex.
j. Tamms Industries, Inc.; Duralbond.
k. ThoRoc, Div. of ChemRex; Epoxy Adhesive 24LPL.
l. Unitex.
m. US MIX Products Company.

3. Thin Film Open Time: Not less than six (6) hours.

C. Latex Bonding Agent: ASTM C 1059.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. Latex Bonding Agent, Type I:

1) Euclid Chemical Company (The); Euco Weld.
2) Kaufman Products, Inc.; Sureweld.
3) Meadows, W. R. Inc.; Intralok.
4) Sika Corporation; Sikalatex.
5) US MIX Products Company; US Spec Bondcoat.

b. Latex Bonding Agent, Type II:

1) Dayton Superior Corporation; Day-Chem Ad Bond (J-40).
2) Euclid Chemical Company (The); Flex-Con.
3) Kaufman Products, Inc.; Surebond.
4) Meadows, W. R. Inc.; Sealtight Acry-Lok.
5) Sonneborn, Div. of ChemRex; Acrylic Additive.
6) US MIX Products Company; US Spec Acrylcoat.

D. Mortar Scrub-Coat: 1 part portland cement complying with ASTM C 150, Type I, II, or III and 1 part fine aggregate complying with ASTM C 144, except 100 percent passing a No. 16 sieve.

2.2 PATCHING MORTAR

A. Patching Mortar, General:

1. Unless otherwise indicated, use any of the products specified in this Article.
2. Overhead Patching Mortar: For overhead repairs, use patching mortar recommended by manufacturer for overhead use and as specified in this Article.
3. Coarse Aggregate for Adding to Patching Mortar: Washed aggregate complying with ASTM C 33, Size No. 8, Class 5S. Add only as permitted by patching mortar manufacturer.

B. Job-Mixed Patching Mortar: 1 part portland cement complying with ASTM C 150, Type I, II, or III and 2-1/2 parts fine aggregate complying with ASTM C 144, except 100 percent passing a No. 16 sieve.

C. Cementitious Patching Mortar: Packaged, dry mix complying with ASTM C 928.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. Cementitious Patching Mortar:

1) Kaufman Products, Inc.; Hicap.
2) MBT Protection and Repair, Div. of ChemRex.
3) Sika Corporation.
4) Sonneborn, Div. of ChemRex; Deep Pour Mortar.
5) Sto Corp., Concrete Restoration Division; Sto Full-Depth Repair Mortar.
6) ThoRoc, Div. of ChemRex; LA Repair Mortar.

b. Cementitious Patching Mortar, Rapid Setting:

1) CGM, Incorporated; Pro Patching Cement.
2) Dayton Superior Corporation.
3) Euclid Chemical Company (The); Euco-Speed.
4) Fox Industries, Inc.; FX-928 Rapid Hardening Mortar.
5) Kaufman Products, Inc.; Duracrete.
6) Meadows, W. R. Inc.
7) Sika Corporation; Sikaset Roadway Patch.
8) Sonneborn, Div. of ChemRex; Road Patch.
9) Sto Corp., Concrete Restoration Division; Sto Rapid Repair Mortar.
10) Tamms Industries, Inc.; Speed Crete 2028.
11) ThoRoc, Div. of ChemRex.
12) Unitex; Patch Set 928.
13) US MIX Products Company; US Spec Transpatch.
14) Watson Bowman Acme Corp., Degussa AG; Wabo Renew 100.

D. Polymer-Modified, Cementitious Patching Mortar: Packaged, dry mix complying with ASTM C 928, that contains a non-redispersible latex additive as either a dry powder or a separate liquid that is added during mixing.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. AQUAFIN, Inc.
b. CGM, Incorporated.
c. Dayton Superior Corporation.
d. Euclid Chemical Company (The).
e. Fox Industries, Inc.
f. Kaufman Products, Inc.
g. MBT Protection and Repair, Div. of ChemRex.
h. Meadows, W. R., Inc..
i. Sika Corporation.

j. Sonneborn, Div. of ChemRex.
k. Sto Corp., Concrete Restoration Division.
l. Tamms Industries, Inc.
m. ThorRoc, Div. of ChemRex, Inc.
n. US MIX Products Company.

E. Polymer-Modified, Silica-Fume-Enhanced, Cementitious Patching Mortar: Packaged, dry mix complying with ASTM C 928, that contains silica fume complying with ASTM C 1240 and a non-redispersible latex additive as either a dry powder or a separate liquid that is added during mixing.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. Euclid Chemical Company (The).
b. Fox Industries, Inc.
c. MBT Protection and Repair.
d. Meadows, W. R., Inc.
e. Sika Corporation.
f. Sonneborn, Div. of ChemRex.
g. US Mix Products Company.

2.3 CONCRETE

A. Concrete Materials and Admixtures: Comply with Section 03 30 00 Cast-in-Place Concrete.

B. Steel and Fiber Reinforcement and Reinforcement Accessories: Comply with Section 03 30 00 Cast-in-Place Concrete.

C. Form-Facing Materials: Comply with Section 03 30 00 Cast-in-Place Concrete.

D. Preplaced Aggregate: Washed aggregate complying with ASTM C 33, Class 5S.

E. Fine Aggregate for Grout Used with Preplaced Aggregate: Fine aggregate complying with ASTM C 33, but with 100 percent passing a No. 8 sieve, 95 to 100 percent passing a No. 16 sieve, 55 to 80 percent passing a No. 30 sieve, 30 to 55 percent passing a No. 50 sieve, 10 to 30 percent passing a No. 100 sieve, 0 to 10 percent passing a No. 200 sieve, and having a fineness modulus of 1.30 to 2.10.

F. Grout Fluidifier for Grout Used with Preplaced Aggregate: ASTM C 937.

G. Portland Cement for Grout Used with Preplaced Aggregate: ASTM C 150.

H. Pozzolans for Grout Used with Preplaced Aggregate: ASTM C 618.

2.4 MISCELLANEOUS MATERIALS

A. Epoxy Joint Filler: 2-component, semirigid, 100 percent solids, epoxy resin with a Type A Shore durometer hardness of at least 80 per ASTM D 2240.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. Anti-Hydro International, Inc.
b. ChemCo Systems; CCS Grout.

c. Euclid Chemical Company (The).
d. Kaufman Products, Inc.
e. MBT Protection and Repair.
f. Meadows, W. R., Inc.
g. Metzger/McGuire.
h. Sika Corporation. i.
Unitex.
j. US Mix Products Company.

B. Polyurea Joint Filler: 2-component, semirigid, 100 percent solids, polyurea resin with a Type A Shore durometer hardness of at least 80 per ASTM D 2240.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. ASTC Polymers.
b. ChemCo Systems; CCS Grout.
c. Dayton Superior Corporation.
d. Euclid Chemical Company (The).
e. MBT Protection and Repair, Div. of ChemRex.
f. Metzger/McGuire.
g. Sonneborn, Div. of ChemRex.

C. Epoxy Crack Injection Adhesive: ASTM C 881/C 881M.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. ChemCo Systems; CCS Grout.
b. Dayton Superior Corporation.
c. Euclid Chemical Company (The).
d. Kaufman Products, Inc.
e. MBT Protection and Repair, Div. of ChemRex.
f. Meadows, W. R., Inc.; Sealtight Rezi-Weld LV.
g. Sika Corporation.
h. Sonneborn, Div. of ChemRex.
i. Tamms Industries, Inc.; Duralcrete LV.
j. Thermal-Chem; Crack Injection.
k. ThorRoc, Div. of ChemRex, Inc.
l. Unitex.
m. US MIX Products Company; US Spec Maxi - Bond 500LV.

D. Capping Adhesive: Product manufactured for use with crack injection adhesive by same manufacturer.

E. Corrosion-Inhibiting Treatment Materials: Water-based solution of alkaline corrosion-inhibiting chemicals that penetrates concrete by diffusion and forms a protective film on steel reinforcement.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. Cortec Corporation.
b. Degussa Corporation; Protectosil CIT.
c. Fox industries, Inc.; FX-361 Migratory Corrosion Inhibitor.
d. Sika Corporation; Sika Ferrogard 903.
e. Sonneborn, Div. of ChemRex; Corrosion Inhibitor.

F. Polymer Overlay: Epoxy adhesive complying with ASTM C 881/C 881M, Type III.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. Kaufman Products, Inc.
b. Meadows, W. R., Inc.; Sealtight Rezi-Weld Type III DOT.
c. Thermal-Chem; Flexgard T, Product 309.
d. Unitex; Pro-Poxy Type III D.O.T.
e. US MIX Products Company; US SPEC Type III Epoxy Binder.

G. Aggregate for Use with Polymer Overlay: Oven-dried, washed silica sand complying with ACI 503.3.

H. Polymer Sealer: Low-viscosity epoxy penetrating sealer recommended by manufacturer for application to exterior concrete traffic surfaces.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. Epoxy Sealers:

1) ChemCo Systems; CCS Coating, Epoxy Healer Sealer.
2) Euclid Chemical Company (The); Euco #512 Epoxy Sealer.
3) Fox Industries, Inc.; FX-452 Epoxy Penetrating Sealer.
4) Kaufman Products, Inc.; SurePoxy Penetrating Sealer.
5) MBT Protection and Repair, Div. of ChemRex; Masterseal GP.
6) Thermal-Chem; Hairline Crack Sealer, Product 207.
7) Unitex; Pro-Seal HS.
8) US MIX Products Company; US Spec Eposeal LVS.

b. High-Molecular-Weight Methacrylate Sealers:

1) Meadows, W. R. Inc.; Sealtight Vocomp-25.
2) Sika Corporation; Sikapronto 19.
3) Transpo Industries, Inc.; Sealate T70.

I. Methylmethacrylate Sealer/Brighteners: Clear low-viscosity sealer recommended by manufacturer for sealing exterior exposed-aggregate concrete, and formulated to bring out color of aggregates and give concrete a wet look.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

a. Dayton Superior Corporation.
b. Kaufman Products, Inc.
c. Meadows, W. R., Inc.; Sealtight CS-309-25.
d. Tamms Industries, Inc.; Luster Seal 300.
e. Unitex; Bright Rock Sealer.
f. US MIX Products Company.

J. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

1. After fabricating, prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

2. After preparation, apply one coat of lead- and chromate-free, modified-alkyd primer complying with MPI#76 and one coat of alkyd-gloss enamel complying with MPI#96.
3. After preparation, apply two-coat high-performance coating system consisting of organic zinc-rich primer, complying with SSPC-Paint 20 or SSPC-Paint 29 and topcoat of high-build, urethane or epoxy coating recommended by manufacturer for application over specified zinc-rich primer. Comply with coating manufacturer's written directions and with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

    a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
    b. Products: Subject to compliance with requirements, provide one of the following:

        1) Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19 and M74/M75 Aliphatic Acrylic Urethane Semi-Gloss.
        2) Carboline Company; Carbozinc 621 and Carboguard 890 2-Component Epoxy.
        3) ICI Devoe Coatings; Catha-Coat 313 and Devthane 378 Aliphatic Urethane Semi-Gloss Enamel
        4) International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer and Interthane 870.
        5) PPG Architectural Finishes, Inc; Aquapon Zinc-Rich Primer ABC 97-670 and Aquapon 97-130 Epoxy.
        6) Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer and Macropoxy HS High Solids Epoxy.
        7) Tnemec Company, Inc.; Tneme-Zinc 90-97 and Series 27 Hi-Build Epoxy.

K. Bolts, Nuts, and Washers: Carbon steel; ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), for bolts; ASTM A 563 (ASTM A 563M), Grade A, for nuts; and ASTM F 436 (ASTM F 436M) for washers; hot-dip or mechanically zinc coated.

L. Postinstalled Anchors: Expansion anchors, made from stainless-steel components complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Alloy Group A1 or A4) for bolts and nuts; ASTM A 666 or ASTM A 276, Type 304 or 316, for anchors, with capability to sustain, without failure, a load equal to four times the load imposed, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

M. Composite Structural Reinforcement: Manufacturer's system consisting of carbon or glass-fiber reinforcement in the form of preimpregnated sheets or tow sheet with field-applied saturant, and epoxy primers, fillers, adhesives, saturants, and topcoats, designed for use as external structural reinforcement for concrete.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:

    a. Sika Corporation; Carbodur and Sikadur 30. b.
    Sumitomo Corporation of America; Replark. c.
    Thermal-Chem; Epic Systems.
    d. VSL (VStructural, LLC), a Structural Group Company; V-Wrap C100. e.
    VSL (VStructural, LLC), a Structural Group Company; V-Wrap EG50. f.
    Watson Bowman Acme Corp., Degussa AG; Wabo MBrace.

2.5 MIXES

A. Mix products, in clean containers, according to manufacturer's written instructions.

1. Add clean silica sand and coarse aggregates to products only as recommended by manufacturer.
2. Do not add water, thinners, or additives unless recommended by manufacturer.

3. When practical, use manufacturer's premeasured packages to ensure that materials are mixed in proper proportions. When premeasured packages are not used, measure ingredients using graduated measuring containers; do not estimate quantities or use shovel or trowel as unit of measure.
4. Do not mix more materials than can be used within recommended open time. Discard materials that have begun to set.

B. Mortar Scrub-Coat: Mix with enough water to provide consistency of thick cream.

C. Dry-Pack Mortar: Mix with just enough liquid to form damp cohesive mixture that can be squeezed by hand into a ball but is not plastic.

D. Concrete: Comply with Section 03 30 00 Cast-in-Place Concrete.

E. Grout for Use with Preplaced Aggregate: Proportion according to ASTM C 938. Add grout fluidifier to mixing water followed by cementitious materials and then fine aggregate.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Notify Architect seven days in advance of dates when areas of deteriorated or delaminated concrete and deteriorated reinforcing bars will be located.

B. Locate areas of deteriorated or delaminated concrete using hammer or chain drag sounding and mark boundaries. Mark areas for removal by simplifying and squaring off boundaries as directed by Architect. At columns and walls make boundaries level and plumb, unless otherwise indicated.

C. Locate at least three reinforcing bars using a pachometer, and drill test holes to determine depth of cover. Calibrate pachometer, using depth of cover measurements, and verify depth of cover in removal areas using pachometer.

3.2 PREPARATION

A. Protect people, motor vehicles, equipment, surrounding construction, Project site, plants, and surrounding buildings from injury resulting from concrete rehabilitation work.

1. Erect and maintain temporary protective covers over pedestrian walkways and at points of entrance and exit for people and vehicles, unless such areas are made inaccessible during the course of concrete rehabilitation work. Construct covers of tightly fitted, 3/4-inch exterior-grade plywood supported at 16 inches o.c. and covered with asphalt roll roofing.
2. Protect adjacent equipment and surfaces by covering them with heavy polyethylene film and waterproof masking tape or a liquid strippable masking agent. If practical, remove items, store, and reinstall after potentially damaging operations are complete.
3. Neutralize and collect alkaline and acid wastes according to requirements of authorities having jurisdiction, and dispose of by legal means off Owner's property.
4. Dispose of runoff from wet operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
5. Collect runoff from wet operations and dispose of by legal means off District's property.

B. Shoring: Install temporary supports before beginning concrete removal.

C. Concrete Removal:

1. Saw-cut perimeter of areas indicated for removal to a depth of at least 1/2 inch. Make cuts perpendicular to concrete surfaces and no deeper than cover on reinforcement.
2. Remove deteriorated and delaminated concrete by breaking up and dislodging from reinforcement.
3. Remove additional concrete, if necessary, to provide a depth of removal of at least 1/2 inch over entire removal area.
4. Where half or more of the perimeter of reinforcing bar is exposed, bond between reinforcing bar and surrounding concrete is broken, or reinforcing bar is corroded, remove concrete from entire perimeter of bar and to provide at least a 3/4-inch clearance around bar.
5. Test areas where concrete has been removed by tapping with hammer, and remove additional concrete until unsound and disbonded concrete is completely removed.
6. Provide fractured aggregate surfaces with a profile of at least 1/8 inch that are approximately perpendicular or parallel to original concrete surfaces. At columns and walls, make top and bottom surfaces level, unless otherwise directed.
7. Thoroughly clean removal areas of loose concrete, dust, and debris.

D. Reinforcing Bar Preparation: Remove loose and flaking rust from reinforcing bars by high-pressure water cleaning, abrasive blast cleaning or wire brushing until only tightly bonded light rust remains.

1. Where section loss of reinforcing bar is more than 25 percent, or 20 percent in 2 or more adjacent bars, cut bars and remove and replace as directed by Architect. Remove additional concrete as necessary to provide at least 3/4-inch clearance at existing and replacement bars. Splice replacement bars to existing bars according to ACI 318, by lapping, welding, or using mechanical couplings.

E. Preparation of Floor Joints for Repair: Saw-cut joints full width to edges and depth of spalls, but not less than 1 inch deep. Clean out debris and loose concrete; vacuum or blow clear with compressed air.

F. Surface Preparation for Corrosion-Inhibiting Treatment: Clean concrete by low-pressure water cleaning, detergent scrubbing or sand blasting to remove dirt, oils, films, and other materials detrimental to treatment application. Allow surface to dry before applying corrosion-inhibiting treatment.

G. Surface Preparation for Overlays: Remove delaminated material and deteriorated concrete surface material. Roughen surface of concrete by shot blasting, high-pressure water jetting or milling to produce a surface profile matching CSP per ICRI 03732. Sweep and vacuum roughened surface to remove debris followed by low-pressure water cleaning.

H. Surface Preparation for Sealers: Clean concrete by shot blasting, low-pressure water cleaning or detergent scrubbing to remove dirt, oils, films, and other materials detrimental to sealer application.

I. Surface Preparation for Sealers: Acid etch surface of concrete to produce a surface profile matching CSP 1 per ICRI 03732.

1. Remove excess acid solution, reaction products, and debris by squeegeeing or vacuuming.
2. Scrub surface with an alkaline detergent, rinse, and squeegee or vacuum.
3. Check acidity of surface with pH test paper and continue rinsing until pH is acceptable.
4. When pH is acceptable and surface is clean, vacuum dry.

J. Surface Preparation for Composite Structural Reinforcement: Remove delaminated material and deteriorated concrete surface material. Clean concrete where reinforcement and epoxy patching mortar is to be applied by low-pressure water cleaning or detergent scrubbing to remove dirt, oils, films, and other materials detrimental to epoxy application. Roughen surface of concrete by sand blasting.

3.3 APPLICATION

A. General: Comply with manufacturer's written instructions and recommendations for application of products, including surface preparation.

B. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent: Apply to reinforcing bars and concrete by stiff brush or hopper spray according to manufacturer's written instructions. Apply to reinforcing bars in two coats, allowing first coat to dry two to three hours before applying second coat. Allow to dry before placing patching mortar or concrete.

C. Epoxy Bonding Agent: Apply to reinforcing bars and concrete by brush, roller, or spray according to manufacturer's written instructions, leaving no pinholes or other uncoated areas. Apply to reinforcing bars in at least two coats, allowing first coat to dry before applying second coat. Apply patching mortar or concrete while epoxy is still tacky. If epoxy dries, recoat before placing patching mortar or concrete.

D. Latex Bonding Agent, Type II: Mix with portland cement and scrub into concrete surface according to manufacturer's written instructions. Apply patching mortar or concrete while bonding agent is still wet. If bonding agent dries, recoat before placing patching mortar or concrete.

E. Latex Bonding Agent, Type I: Apply to concrete by brush roller or spray. Allow to dry before placing patching mortar or concrete.

F. Mortar Scrub-Coat: Dampen repair area and surrounding concrete 6 inches beyond repair area. Remove standing water and apply scrub-coat with a brush, scrubbing it into surface and thoroughly coating repair area. If scrub-coat dries, recoat before applying patching mortar or concrete.

G. Patching Mortar: Unless otherwise recommended by manufacturer, apply as follows:

1. Wet substrate thoroughly and then remove standing water. Scrub a slurry of neat patching mortar into substrate, filling pores and voids.
2. Place patching mortar by troweling toward edges of patch to force intimate contact with edge surfaces. For large patches, fill edges first and then work toward center, always troweling toward edges of patch. At fully exposed reinforcing bars, force patching mortar to fill space behind bars by compacting with trowel from sides of bars.
3. For vertical patching, place material in lifts of not more than 1 inch nor less than 1/8 inch. Do not feather edge.
4. For overhead patching, place material in lifts of not more than 1 inch nor less than 1/8 inch. Do not feather edge.
5. After each lift is placed, consolidate material and screed surface.
6. Where multiple lifts are used, score surface of lifts to provide a rough surface for application of subsequent lifts. Allow each lift to reach final set before placing subsequent lifts.
7. Allow surfaces of lifts that are to remain exposed to become firm and then finish to a smooth surface with a sponge float broom.
8. Wet-cure cementitious patching materials, including polymer-modified, cementitious patching materials, for not less than seven days by water-fog spray or water-saturated absorptive cover.

H. Dry-Pack Mortar: Use for deep cavities and where indicated. Unless otherwise recommended by manufacturer, apply as follows:

1. Provide forms where necessary to confine patch to required shape.
2. Wet substrate and forms thoroughly and then remove standing water.
3. Place dry-pack mortar into cavity by hand, and compact into place with a hardwood drive stick and mallet or hammer. Do not place more material at a time than can be properly compacted. Continue placing and compacting until patch is approximately level with surrounding surface.
4. After cavity is filled and patch is compacted, trowel surface to match profile and finish of surrounding concrete. A thin coat of patching mortar may be troweled into the surface of patch to help obtain required finish.
5. Wet-cure patch for not less than seven days by water-fog spray or water-saturated absorptive cover.

I. Concrete: Place according to Section 03 30 00 Cast-in-Place Concrete and as follows:

1. Apply epoxy-modified, cementitious bonding and anticorrosion agent to reinforcement and concrete substrate.

2. Apply latex bonding agent to concrete substrate.
3. Use vibrators to consolidate concrete as it is placed.
4. At unformed surfaces, screed concrete to produce a surface that when finished with patching mortar will match required profile and surrounding concrete.
5. Place concrete by form and pump method.

    a. Design and construct forms to resist pumping pressure in addition to weight of wet concrete. Seal joints and seams in forms and junctions of forms with existing concrete.
    b. Pump concrete into place, releasing air from forms as concrete is introduced. When formed space is full, close air vents and pressurize to 14 psi.

6. Wet-cure concrete for not less than seven days by leaving forms in place or keeping surfaces continuously wet by water-fog spray or water-saturated absorptive cover.
7. Fill placement cavities with dry-pack mortar and repair voids with patching mortar. Finish to match surrounding concrete.

J. Grouted Preplaced Aggregate Concrete: Use for column and wall repairs where indicated. Place as follows:

1. Design and construct forms to resist pumping pressure in addition to weight of wet grout. Seal joints and seams in forms and junctions of forms with existing concrete.
2. Apply epoxy-modified, cementitious bonding and anticorrosion agent to reinforcement and concrete substrate.
3. Place aggregate in forms, consolidating aggregate as it is placed. Pack aggregate into upper areas of forms to achieve intimate contact with concrete surfaces.
4. Fill forms with water to thoroughly dampen aggregate and substrates. Drain water from forms before placing grout.
5. Pump grout into place at bottom of preplaced aggregate, forcing grout upward. Release air from forms at top as grout is introduced. When formed space is full and grout flows from air vents, close vents and pressurize to 14 psi.
6. Wet-cure concrete for not less than seven days by leaving forms in place or keeping surfaces continuously wet by water-fog spray or water-saturated absorptive cover.
7. Repair voids with patching mortar and finish to match surrounding concrete.

K. Joint Filler: Install in nonmoving floor joints where indicated.

1. Install filler to a depth of at least 1 inch. Use fine silica sand no more than 1/4 inch deep to close base of joint. Do not use sealant backer rods or compressible fillers below joint filler.
2. Install filler so that when cured, it is flush at top surface of adjacent concrete. If necessary, overfill joint and remove excess when filler has cured.

L. Epoxy Crack Injection: Comply with manufacturer's written instructions and the following:

1. Clean areas to receive capping adhesive of oil, dirt, and other substances that would interfere with bond, and clean cracks with oil-free compressed air or low-pressure water to remove loose particles.
2. Place injection ports as recommended by epoxy manufacturer, spacing no farther apart than thickness of member being injected. Seal injection ports in place with capping adhesive.
3. Seal cracks at exposed surfaces with a ribbon of capping adhesive at least 1/4 inch thick by 1 inch wider than crack.
4. Inject cracks wider than 0.003 inch to a depth of 8 inches or to a width of less than 0.003 inch, whichever is less.
5. Inject epoxy adhesive, beginning at widest part of crack and working toward narrower parts. Inject adhesive into ports to refusal, capping adjacent ports when they extrude epoxy. Cap injected ports and inject through adjacent ports until crack is filled.
6. After epoxy adhesive has set, remove injection ports and grind surfaces smooth.

M. Corrosion-Inhibiting Treatment: Apply by brush, roller, or airless spray in two coats at manufacturer's recommended application rate. Remove film of excess treatment by high-pressure washing before patching treated concrete.

1. Apply to areas indicated.

N. Polymer Overlay: Apply according to ACI 503.3.

1. Apply to traffic-bearing surfaces, including parking areas and walks.

O. Polymer Sealer: Apply by brush, roller, or airless spray at manufacturer's recommended application rate.

1. Apply to traffic-bearing surfaces, including parking areas and walks.

P. Methylmethacrylate Sealer/Brighteners: Apply by brush, roller, or airless spray at manufacturer's recommended application rate.

1. Apply to exterior concrete surfaces that are exposed to view, excluding traffic-bearing surfaces.

Q. Composite Structural Reinforcement Using Preimpregnated Fiber Sheet: Unless otherwise recommended by manufacturer, apply as follows:

1. Patch surface defects with epoxy mortar and allow to set before beginning reinforcement application.
2. Apply epoxy adhesive to a thickness of 1/16 inch to prepared concrete surfaces in areas where composite structural reinforcement will be applied.
3. Clean preimpregnated fiber sheet with acetone or other suitable solvent, and apply epoxy adhesive to a thickness of 1/16 inch.
4. Apply adhesive-coated fiber sheet to adhesive-coated concrete within open time of epoxy adhesive, and roll with a hard rubber roller until fiber sheet is fully embedded in adhesive, air pockets are removed, and adhesive is forced out from beneath fiber sheet at edges.
5. Apply additional layers as indicated using same procedure.

R. Composite Structural Reinforcement Using Fiber Tow Sheet and Saturant: Unless otherwise recommended by manufacturer, apply as follows:

1. Apply epoxy primer using brush or short nap roller to prepared concrete surfaces in areas where composite structural reinforcement will be applied.
2. After primer has set, patch surface defects with epoxy filler and allow to set before beginning reinforcement application.
3. Apply epoxy saturant to fiber tow sheet or primed and patched surface with 3/8-inch nap roller. Apply fiber tow sheet to primed and patched surface while saturant is still wet, using pressure roller to remove air pockets. Remove paper backing from fiber tow sheet and apply additional epoxy as needed to fully saturate tow sheet.
4. Apply additional layers as indicated, fully saturating each with epoxy.
5. After saturant has cured, apply protective topcoat by brush, roller, or spray.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to sample materials and perform tests as follows:

1. Patching Mortar, Packaged Mixes: Three (3) randomly selected samples tested according to ASTM C 928.
2. Patching Mortar, Field Mixed: Three (3) randomly selected samples tested for compressive strength according to ASTM C 109/C 109M.
3. Concrete: As specified in Section 03 30 00 Cast-in-Place Concrete.
4. Grouted Preplaced Aggregate: Tested for compressive strength of grout according to ASTM C 942.

    a. Testing Frequency: One sample for each 25 cu. yd. of grout or fraction thereof, but not less than one sample for each day's work.

5. Joint Filler: Core drilled samples to verify proper installation.

   a. Testing Frequency: One sample for each 100 feet of joint filled.
   b. Where samples are taken, fill holes with joint filler.

6. Epoxy Crack Injection: Core drilled samples to verify proper installation.

   a. Testing Frequency: 3 samples from mockup and 1 sample for each 100 feet of crack injected.
   b. Where samples are taken, fill holes with epoxy mortar.

END OF SECTION

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SECTION 03 10 00

CONCRETE FORMS AND ACCESSORIES

PART 1 GENERAL

1.01 Provisions of Divisions 01 apply to this section

1.02 SECTION INCLUDES

A. Formwork for cast-in-place concrete as indicated.

B. Installation of items to be embedded in concrete, such as anchor bolts, inserts, embeds, and sleeves.

1.03 RELATED REQUIREMENTS

A. Section 01 42 00: Testing and Inspection.

B. Section 03 20 00: Concrete Reinforcement.

C. Section 03 30 00: Cast-In-Place Concrete

1.04 SYSTEM DESCRIPTION

A. Work shall be in accordance with CBC, Chapter 19A, Concrete.

1.05 SUBMITTALS

A. Submit Shop Drawings indicating locations of forms, joints, embedded items, and accessories.

B. Submit manufacturer's product data for form materials and accessories.

1.06 QUALITY ASSURANCE

A. As a minimum requirement, conform to ACI 347, Chapter 1: Design and Chapter 3: Materials for Formwork; ACI 301, "Specifications for Structural Concrete for Buildings", as applicable, and for plywood, conform to tables for form design and strength in APA Form V 345.

B. Provide mock-ups for architectural exposed finishes.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials for forms in timely manner to ensure uninterrupted progress.

B. Store materials by methods that prevent damage and permit inspection and identification.

PART 2 PRODUCTS

2.01 GENERAL

A. Form materials may be reused provided they are completely cleaned and reconditioned, recoated for each use, capable of producing formwork of required quality, and are structurally sound.

B. Form Lumber: WCLIB Construction Grade or Better, WWPA No. 1 or Better.

C. Plywood: PS 1 95, Group I, Exterior Grade B-B Plyform or better.

D. For exposed painted concrete, plastic overlaid plywood of grade specified above, factory coated with a form coating and release agent Noxcrete", or equal.

E. Tube Forms: Burke "SmoothTube," Sonoco "Seamless Sonotubes," or Alton Building Products "Sleek Seamless Standard Wall," of the type leaving no marks in concrete.

F. Joist Forms: Code recognized steel or molded plastic types as required.

G. Special Forms: For exposed integrally-colored concrete, plywood as above with high density overlay, plywood with integral structural hardboard or fibrous glass reinforced plastic facing.
H. For Exposed Concrete Finish, material can be the following types: plywood, glass, steel and a combination plywood formwork types.
I. Form Ties: Prefabricated rod, flat band, wire, internally threaded disconnecting type.
J. Form Coating: Non-staining clear coating free from oil, silicone, wax, not grain-raising, or "Cast-Off".
K. Form Liner: Rigid or resilient type.
L. Void Forms: Forms shall be "WallVoid" for temporary support and "SlabVoid" for creating gaps. Void forms shall be fabricated of corrugated paper with moisture resistant exterior and shall be capable of withstanding working load of 1,500 psf.

PART 3 EXECUTION

3.01 GENERAL

A. Forms shall be constructed so as to shape final concrete structure conforming to shape, lines and dimensions of members. They shall be properly braced or tied together and their supports shall be designed so that previously placed structures will not be damaged.

3.02 ERECTION

A. Plywood shall be installed with horizontal joints level, vertical joints plumb and with joints tight. Reused plywood shall bethoroughly cleaned and repaired, nail plywood to maintain alignment and prevent warping.

B. Provide temporary openings at points in formwork to facilitate cleaning and inspection.

3.03 REMOVAL OF FORMS

A. Forms shall not be removed until concrete has sufficiently hydrated and shoring shall not be removed until member has acquired sufficient strength.

B. Compressive strength of in-place concrete shall be determined by testing field-cured specimens representative of concrete location or members, as specified in Cast-In-Place Concrete.

3.04 PROTECTION

A. Protect the Work of this section until Substantial Completion.

3.05 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 03 20 00

CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Reinforcing steel for cast-in-place concrete and concrete masonry units.

B. Supports and accessories for steel reinforcement.

1.2 RELATED SECTIONS

A. Section 03 10 00 - Concrete Forms and Accessories.

B. Section 03 30 00 - Cast-in-Place Concrete.

C. Section 03 45 00 - Architectural Precast Concrete: Reinforcement for precast concrete panels.

1.3 REFERENCES

A. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International.

B. ACI 318- Building Code Requirements For Reinforced Concrete and Commentary; American Concrete Institute International.

C. ACI SP-66 - ACI Detailing Manual; American Concrete Institute International.

D. ASTM A 82- Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

E. ASTM A 184/A 184M - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement.

F. ASTM A 185- Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.

G. ASTM A 497/A 497M- Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.

H. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel 1;3ars for Concrete Reinforcement.

I. ASTM A 704/A 704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.

J. ASTM A 706/A 706M- Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.

K. ASTM A 996/A 996M -Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.

L. AWS D1.4 - Structural Welding Code- Reinforcing Steel; American Welding Society.

M. California Code of Regulations (CCR) Title 24 California Building Code (CBC). 2010 Edition.

N. CRSI (DA4)- Manual of Standard Practice; Concrete Reinforcing Steel Institute.

O. CRSI (P1)- Placing Reinforcing Bars; Concrete Reinforcing Steel Institute.

1.4 SUBMITTALS

A. Shop Drawings: Only when deviations are made from the contract documents, submit shop drawings under provision of Section 01 33 13 with deviations clearly identified.

1. Indicate sizes, spacings, locations and quantities of reinforcing steel, wire fabric, bending and cutting schedules, splicing, stirrup spacing, supporting and spacing devices.

B. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

C. Reports: Submit certified copies of mill test report of reinforcement materials analysis, indicate physical and chemical analysis.

D. Welders Certificates: Submit certifications for welders employed on the project, verifying AWS qualifications within the previous 12 months.

1.5 QUALITY ASSURANCE

A. Perform work of this section in accordance with CRSI (DA4), CRSI (P1), ACI 301, and ACI SP-66.

B. Tests of Reinforcing bars shall be in conformance with 2010 CBC Sections 1916A.2 and 1704A.4.1.

PART 2 - PRODUCTS

2.1 REINFORCEMENT

A. Reinforcing Steel: ASTM A 615/A 615M Grade 60.

1. Deformed billet-steel bars.

2. Unfinished.

B. Reinforcing Steel: ASTM A 706/A 706M, deformed low-alloy steel bars.

1. Unfinished.

C. Steel Welded Wire Reinforcement: ASTM A185/A 185M, plain type.

1. Welded Wire Mat Reinforcing: mesh size and gage as indicated on drawings.

D. Steel Welded Wire Reinforcement: ASTM A 497, deformed type.

1. Flat Sheets.

2. Mesh Size and Wire Gage: As indicated on drawings.

E. Reinforcement Accessories:

1. Tie Wire: Annealed, minimum 16 gage acceptable patented system.

2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement, including load bearing pad on bottom to prevent vapor barrier puncture.

3. Provide stainless steel, plastic, or plastic coated steel components for placement within 1 %" of weathering surfaces.

2.2 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI (DA4)- Manual of Standard Practice.

B. Welding of reinforcement, in conformance with 2010 CBC Section 1903A.7 with Table 1704A.3, is permitted only with the specific approval of Structural Engineer. Perform welding in accordance with AWS D1.4.

C. Obtain approval from the architect/engineer for additional reinforcing splices not indicated on drawings.

PART 3 - EXECUTION

3.1 PLACEMENT

A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.

C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

D. Do not displace or damage vapor barrier.

E. Accommodate placement of formed openings.

3.2 FIELD QUALITY CONTROL

A. An independent testing agency, as specified in Section 01 40 00, will inspect installed reinforcement for conformance to contract documents before concrete placement.

END OF SECTION

SECTION 03 25 00

CONCRETE TOPPING

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes floor topping with integral color, applied over previously placed base slab at interior and exterior slabs.

1.02 REFERENCES

A. Comply with requirements of Section "Cast-In-Place Concrete" and as herein specified. B.

In addition to sample specified in "Cast-In-Place Concrete" submit 12" square samples of proposed concrete toppings with integral finish for preliminary review.

1.03 SUBMITTALS

A. Furnish laboratory test reports, and materials certificates as specified in Section "Cast-In-Place Concrete.", submit product data for proprietary products and produce a mock-up of the concrete topping representing the specified color, finish, and joint detail and pattern.

PART 2 PRODUCTS

2.01 CEMENT AND AGGREGATES

A. Portland Cement: ASTM C150, Type I or Type III

B. Aggregate: Normal Weight, ASTM C33

C. Fly Ash will not be permitted

D. Integral Concrete Colorant is produced by natural and synthetic iron oxides and chromium oxides, compounded for use in ready-mix concrete. Mix, place, finish, cure and provide other activities to produce concrete of reasonably uniform color, texture and durability, as approved. Ready-mix concrete may be placed in 2 lifts after review of procedures to assure water-cementitious materials ratio and temperature of both lifts are identical and placement of top lift before initial set of lower lift.

E. Curing Compounds and Sealers are as recommended by colorant manufacturer.

2.02 TOPPING MIX

A. Design mix to produce topping material with f'c = 3000 psi at 28 days, slump and maximum W/C ratio as specified in Section 033000 and 150 lbs per cu. foot.

2.03 MIXING

A. Provide batch type mechanical mixer for mixing topping material at Project site and only use mixers that are capable of mixing aggregates, cement, and water into a uniform mix within specified time

B. Mix each batch after ingredients are in mixer. Ready-mixed topping may be used when acceptable to College's Representative

PART 3 EXECUTION

3.01 CONDITION OF SURFACES

A. Remove contaminants, leaving a clean surface of hardened concrete. Roughen base slab surface of hardened concrete for acceptable bonding. Dampen slab surface prior to placing topping mixture, which should be placed after rewettable bonding compound has dried or epoxy

adhesive is still tacky.

3.02 PLACING AND FINISHING

A. Spread topping mixture evenly to the required elevation and strike off. After the topping has stiffened sufficiently and water sheen has disappeared, float the surface at least twice to a uniform sandy texture.

B. Trowel in joints as shown.

C. After floating, begin trowel finish operation using power driven trowels.

D. Perform operations as necessary to match mock-up and apply a light hand trowel finish followed by the finish indicated after final floating.

3.03 CURING AND PROTECTION

A. Cure concrete with curing compound recommended by the colorant material manufacturer.

B. Protect topping applications and finishes as specified in Section "Cast-In-Place Concrete."

3.04 PERFORMANCE

A. Failure of concrete topping to bond to substrate, or disintegration or other failure of topping to perform as a floor finish will be considered failure of materials and workmanship.

3.05 CLEAN UP

A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 WORK INCLUDES:

A. Cast in place structural concrete.

B. Precast concrete.

C. Non-structural concrete.

1.2 RELATED SECTIONS:

A. Section 03 10 00 - Concrete Formwork and Accessories.

B. Section 03 20 00 - Concrete Reinforcement.

C. Section 03 45 OO-Precast Architectural Concrete.

D. Section 07 26 16 – Under Slab Vapor Retarders.

E. Section 07 92 05 – Joint Sealers.

F. Section 32 13 16 - Concrete Paving.

1.3 REFERENCES

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International.

B. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete; American Concrete Institute International

C. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International.

D. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International.

E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International.

F. ACI 305R- Hot Weather Concreting; American Concrete Institute International.

G. ACI 306R- Cold Weather Concreting; American Concrete Institute International.

H. ACI 308R- Guide to Curing Concrete; American Concrete Institute International.

I. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International.

J. ASTM C 33- Standard Specification for Concrete Aggregates.

K. ASTM C 39/C 39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

L. ASTM C 94/C 94M - Standard Specification for Ready-Mixed Concrete.

M. ASTM C 143/C 143M- Standard Test Method for Slump of Hydraulic-Cement Concrete.

N. ASTM C 150 - Standard Specification for Portland Cement.

O. ASTM C 171 -Standard Specification for Sheet Materials for Curing Concrete.

P. ASTM C 173/C 173M- Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.

Q. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete.

R. ASTM C 309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

S. ASTM C 330 – Standard Specification for Lightweight Aggregates for Structural Concrete.

T. ASTM C 494/C 494M - Standard Specification for Chemical Admixtures for Concrete.

U. ASTM C 618- Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

V. ASTM C 685/C 685M – Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing.

W. ASTM C 881/C 881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

X. ASTM C 1059 - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete.

Y. ASTM C 1107/C 1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

Z. ASTM E 1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers.

AA. ASTM E 1155M - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers [Metric].

BB. California Code of Regulations (CCR) Title 24 California Building Code (CBC), 2010 Edition.

1.4 DEFINITIONS

A. Severe Exposure: Concrete which is in contact with moisture or deicing salts, such as pavements, sidewalks, parking garage floors, etc.

B. Moderate Exposure: Concrete which is occasionally exposed to moisture, such as exterior walls, beams, girders, and slabs not in contact with soil, etc.

1.5 SUBMITTALS

A. General: Submit in accordance with Section 01 33 13.

B. Shop Drawings: Submit drawings locating slab-on-grade construction joints, control joints, and isolation joints.

C. Product Data: Submit product data for proprietary products.

D. Sample: Provide 48 inch by 48 inch mock-up of each topping slab type, complete with integral color and finish as indicated on architectural color schedule. Sample to be reviewed and approved by architect prior to actual concrete placement of topping slab.

E. Mix Designs:

1. Submit proposed concrete mix designs for each class or use at least 30 days prior to required delivery.

2. Obtain Owner's Testing Laboratory approval prior to submitting mix designs for Architect/Engineer approval.

3. Mixes shall be prepared by a professional engineer licensed in the state in which the project is located.

4. Each concrete mixtures containing fly ash as replacement for Portland Cement or other Portland Cement replacements and for equivalent concrete mixtures that do not contain Portland Cement replacements.

5. Specifically indicate where each class of concrete is to be used.

6. Indicate individual and combined aggregate gradations and aggregate source and characteristics.

F. For concrete, accompany each load of materials or concrete with signed copy of batch plant's certificates stating quantity of each material, amount of water, admixtures, departure time and date.

1. When batch plant inspection is waived, provide affidavit in accordance with Title 24, Part 2, Section 1704A.4.3 to Owner's Testing Laboratory.

G. Test Reports: Submit aggregate and concrete mix test reports from independent testing laboratory as required by Division 1.

1.6 QUALITY ASSURANCE

A. Certifications:

1. Submit material certification for admixtures and aggregates, certifying their compliance with specifications.

2. Submit certified mill test reports for each lot of cement.

B. Perform work of this section in accordance with ACI 301 and ACI 318.

C. Acquire cement from same source and aggregate from same source for entire project.

D. Follow recommendations of ACI 305R for concreting during hot weather.

E. Follow recommendations of ACI 306R for concreting during cold weather.

F. Proportions of concrete shall conform to 2010 CBC, Sections 1905A.2, 1905A.3 and 1905A.4.

1.7 PRE-INSTALLATION CONFERENCE

A. Conduct pre-installation conference in accordance with Section 01 30 00.

PART 2 - PRODUCTS

2.1 FORMWORK

A. Comply with the requirements of Section 03 10 00.

2.2 REINFORCEMENT

A. Comply with the requirements of Section 03 20 00.

2.3 CONCRETE MATERIALS

A. Portland Cement:

1. ASTM C150, Type as indicated in the structural drawings and in conformance with 2010 CBC, Sections 1704A.4.1 and 1916A.1.

2. Air-entraining portland cement, as defined by ASTM C150, is prohibited.

B. Aggregate:

1. Coarse Aggregate in conformance with 2010 CBC, Sections 1704A.4.1 and 1903A.3:

a. ASTM C33 for normal weight aggregate.

b. ASTM C330 for lightweight aggregate.

2. Fine Aggregate: ASTM C33.

3. Exposed Aggregate: To match Architect's sample.

C. Water: Clean, fresh and potable.

D. Admixtures:

1. Calcium chloride, thiocyanates, or admixtures containing more than 0.05 percent chloride ions are not permitted unless approved by Architect.

2. Air Entraining: ASTM C260.

3. Water-reducing: ASTM C494, Type A.

4. High Range Water-reducing (Superplasticizer): ASTM C494, Type F or Type G.

5. Fly Ash: ASTM C 618, Class Nor F (Class Cis not permitted).

a. Maximum 15% by weight of fly ash or other pozzolan may be substituted for ASTM C-150 Portland Cement.

6. Water-reducing, Non-corrosive, Non-chloride Accelerator:

   a. ASTM C494, Type E.

   b. Submit long term non-corrosive test data from independent testing laboratory using accelerated test method such as electrical potential measure.

7. Water-reducing, Retarding: ASTM C494, Type D.

E. Bonding Admixture:

1. Acrylic or styrene butadiene, non re-emulsifiable.

2. Acceptable Products:

   a. Flex-Con or SBR Latex, Euclid Chemical Company, Cleveland, OH.

   b. Everbond, L&M Construction Chemicals, Inc., Omaha, NE.

   c. Intralok, W. R. Meadows, Inc., Elgin IL.

F. Bonding Grout:

1. Mix consisting of portland cement, part fine sand passing No. 30 mesh sieve, bonding admixture, and water in proportions as recommended by bonding admixture manufacturer.

2. Minimum 1:1 cement to sand ratio.

3. Mix to achieve consistency of thick cream.

2.4 CURING MATERIALS

A. Sheet Curing Materials: ASTM C171; white opaque polyethylene film, white polyethylene coated burlap sheeting, or regular waterproof paper.

B. Dissipating Resin Curing Compounds:

1. ASTM C309, Type 1 [1-D] clear or translucent [with fugitive dye] [Type 2 white pigmented at exterior locations], Class B, free of natural or petroleum waxes. Class A not acceptable.

2. Liquid, membrane forming, 100 percent resin based allowing maximum moisture loss in 72 hours of 0.11 lb/sq. ft..

3. Compatible with subsequent coatings and toppings.

4. Acceptable Products:

   a. Kurex, Cham-Masters Corporation, Madison, OH.

   b. Kurez DR, Euclid Chemical Company, Cleveland, OH.

   c. L&M Cure DR, L&M Construction Chemicals, Inc., Omaha, NE.

   d. 3100 Clear, W. R. Meadows, Inc., Elgin, IL.

   e. ABCO 1309 Resin Cure, Nox-Crete Chemicals, Omaha, NE.

   f. Kurez VOX, Euclid Chemical Co., Cleveland, OH.

g. L&M CureR, L&M Construction Chemicals, Inc,. Omaha, NE

h. 1100 Clear, W.R. Meadows, Elgin, IL.

C. Water Based Acrylic Curing/Sealing Compounds at areas to be left exposed:

1. ASTM C1315, Type I, Class A [B] [C], VOC compliant, free of natural or petroleum waxes. Dries clear with high [medium] gloss sheen.

2. Liquid, membrane forming, minimum 30 percent [20 percent] acrylic resin solids, allowing maximum moisture loss in 72 hours of 0.08 lb/sq. ft.

3. Compatible with subsequent coatings and toppings.

4. Acceptable Products:

a. Super Diamond Clear VOX, Euclid Chemical Company, Cleveland, OH.

b. Dress & Seal WB 30, L&M Construction Chemicals, Inc., Omaha, NE.

c. VOCOMP 30, W. R. Meadows, Inc., Elgin, IL.

2.5 PATCHING AND REPAIR MATERIALS

A. Epoxy Adhesive:

1. 100 percent solids, two component material suitable for use on dry or damp surfaces, conforming to ASTM C881.

2. Acceptable Products and Manufacturers:

a. Concresive Liquid LPL, Master Builders, Inc., Cleveland, OH.

b. Sikadur Hi-Mod 32, Sika Corporation, Lyndhurst, NJ.

c. Euco 452 or 620 System, Euclid Chemical Company, Cleveland, OH.

B. Patching Compound:

1. Polymer modified cementitious mortar.

2. Acceptable Products and Manufacturers:

a. Thin Coat, Concrete Coat, or Verticoat, Euclid Chemical Company, Cleveland, OH.

b. Duratop, L&M Construction Chemicals, Inc., Omaha, NE.

c. Sikatop 121, 122, or 123, Sika Corporation, Lyndhurst, NJ.

C. Patching Mortar:

1. Comprised of same materials and approximately same proportions as used for surrounding concrete, except with coarse aggregate omitted.

2. Consisting of not more than 1 part cement to 2-1/2 parts sand.

3. Substitute white portland cement for portion of gray portland cement to match color of surrounding exposed concrete.

4. Limit mixing water to no more than necessary for handling and placing. Maximum water/cement ratio of 0.50.

D. Bonding Agent:

1. Acrylic, ASTM C1059, Type II, Non redispersable.

2. Acceptable Products and Manufacturers:

a. Everbond, L&M Construction Chemicals, Inc., Omaha, NE.

b. Daraweld-C, Grace Construction Products, Cambridge, MA.

c. Intralok, W. R. Meadows, Inc., Elgin IL.

E. Evaporation Retardants:

1. Eucofilm, Euclid Chemical Co., Cleveland, OH.

2. E-Con, L&M Construction Chemicals, Inc., Omaha, NE.

3. Confilm, Master Builders, Inc., Cleveland, OH.

2.6 CONCRETE MIXES

A. Proportioning shall be in conformance with 2010 CBC Sections 1905A.2, 1905A.3 and 1905A.4.

1. Proportioning shall be by weight of loose, dry material.

a. 94 pounds of cement shall be considered 1 cubic foot.

b. Fine aggregate volume shall be at least 35%, with maximum of 50%, of sum of separate fine and coarse aggregate volumes.

c. Weighing equipment shall be accurate to within 1 pound and be adjustable for varying aggregate moisture content. Beam auxiliary shall register any part of last 100 pounds of each aggregates; aggregate hopper shall have volume adjustment.

2. Lightweight Coarse Aggregate: Measure by volumetric batching.

3. Accurately control proportions, water content, and air content.

a. Admixtures: Conform to type specified.

b. Quantity per sack of cement and method of using admixture shall be in accordance with recommendations of manufacturer and laboratory furnishing mix design.

c. Cement Grout: One part by volume Portland cement and 2-1/2 parts fine aggregate.

d. Mix dry; add just enough water to make mixture flow under its own weight.

e. Patching Mortar: Mix liquid

f. Combine dry mix with liquid and add water in proportions recommended by manufacturer.

B. Mix Design:

1. Submit design mixes for each type and class of concrete based on laboratory trial batch method or field experience methods described in ACI-318, Chapter 5.

2. If trial batch method is used, employ an independent testing agency acceptable to Architect for preparing and reporting proposed mix designs. Mix designs are to be prepared by a professional engineer licensed in the state in which the project is located. Contractor employed testing agency shall not be same firm as Owner employed testing agency;

3. Use concrete of approved mix designs only.

4. The proportioning of ingredients shall provide a concrete readily worked into forms and around reinforcement under conditions of placement to be employed, without segregation or excessive bleeding.

5. Do not place concrete until design mix for that class and type of concrete is reviewed by Architect.

6. Indicate locations in structure where each mix design is to be used.

7. Identify each mix design with code number which will be used on batch tickets.

C. Design Compressive Strengths: As indicated on Structural Drawings.

1. Normal Weight Concrete:

   a. Compressive strength, when tested in accordance with ASTM C 39/C 39M, strength at 7 days shall be at least 60% of the minimum required 28 day strength unless noted otherwise on drawings.

   b. Maximum slump 4 inches.:!: 1".

2. Lightweight Weight Concrete:

   a. Compressive strength, when tested in accordance with ASTM C 39/C 39M, strength at 7 days shall be at least 60% of the minimum required 28 day strength unless noted otherwise on drawings.

   b. Maximum slump 4 inches.:!: 1".

   c. The air dry unit weight shall be determined by ASTM C567, except that the drying time shall be 90 days.

D. Maximum Size of Coarse Aggregate:

1. 1/5 narrowest dimension between form sides.

2. 1/3 depth of slabs.

3. 3/4 of minimum clear distance between reinforcing bars, wires, or bundles of bars.

4. 1 inch maximum for normal weight concrete or 5/8 inch maximum for light weight concrete.

E. Concrete Slump at Point of Discharge:

1. Ramps and Sloping Surfaces: Not more than 3 inches.

2. Reinforced Foundations: Not less than 1 inch and not more than 4 inches.

3. Concrete Containing Superplasticizer: Not more than 9 inches after addition of superplasticizer. Slump before addition of superplasticizer: 2 to 3 inches

4. Other Concrete: Not less than 1 inch and not more than 4 inches.

5. Allowable tolerances of up to 1 inch above maximum indicated provided average of 10 most recent batches tested is less than maximum.

F. Minimum Cement Content: Not less than 470 pounds of total cementitious material per cubic yard of concrete. Not more than 15% flyash or pozzolan cement substitute and not less than 385 pounds of cement per cubic yard of concrete.

G. Water-Cement Ratios for Concrete (by weight):

1. Maximum permissible water cement ratio: 0.50 unless noted otherwise on drawings.

H. Admixtures:

1. Only use admixtures which have been tested and approved in mix designs.

2. Air entraining Admixture:

a. Use in concrete exposed to freezing and thawing at any time during construction or in completed structure.

b. Use in concrete placed at ambient temperatures below 40 degrees F.

c. Tolerance on air content as delivered: Plus or minus 1-1/2 percent.

3. Conform to air content requirements indicated on Drawings.

I. Maximum water soluble chloride ion concentrations in hardened concrete at ages from 28 to 42 days contributed from all ingredients, expressed as percent by weight of cement as follows:

1. Concrete over galvanized deck: 0.06 percent.

2. Concrete exposed to chloride in service: 0.15 percent.

3. Other concrete: 1.00 percent.

J. Shrinkage Tests:

1. Prior to placing any concrete for walls or horizontal surfaces, a trial batch of each mix design of structural concrete shall be prepared using the aggregates, cement and admixture (if any) proposed for the project. From each trial batch at least 3 specimens for determining drying shrinkage shall be prepared. The drying shrinkage specimens shall be a 4" x 4" x 11" prisms fabricated, cured, dried, and measured in accordance with the requirements of Tentative Method of Test for Length Change of Cement Mortar and Concrete, ASTM C157. The measurements shall be made and reported separately for 7 and 28 days of drying after 7 days of moist curing. The effective gage length of the specimens shall be 10", and except for the foundation concrete, the average drying shrinkage at 35 days shall not exceed .054%.

2. Previous Test: Ready-mixed concrete manufacturer may furnish certified test reports from approved Testing Laboratory as proof of meeting shrinkage requirements, provided aggregate used and concrete covered by such test report conform to mix design approved for use on this project. Method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs.

K. Use accelerating admixtures in cold weather only when approved by Architect. Use of admixtures will not relax cold weather placement requirements.

2.7 MIXING

A. Ready-Mix Concrete:

1. Comply with ASTM C 94/C 94M.

2. Before using trucks for batching, m1x1ng, and transporting concrete, thoroughly clean trucks and equipment of materials capable of contaminating concrete.

3. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 is required.

4. When air temperature is between 85 degrees F and 90 degrees F, reduce mixing and delivery time from 90 minutes to 75 minutes, and when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

5. Do not add water to ready-mix concrete at Project site except when slump is below specified limits and total water does not exceed the design water-cement ratio; inject added water into mixer and mix thoroughly before discharging.

B. Provide certificate signed by authorized official of supplier with each load of concrete stating following:

1. Time truck left plant.

2. Mix of concrete, identify with code number of mix design.

3. Amount of water and cement in mix.

4. Amount and type of admixtures.

5. Amount of water added at project site.

6. Time truck is unloaded at project site.

C. Truck mixers without batch tickets will be rejected.

D. Retain certificates at Project site. Submit to Architect for review upon request.

2.8 PRODUCTION

A. Ready Mixed Concrete

1. Except as otherwise provided in these specifications, ready mixed concrete shall be batched, mixed, and transported in accordance with ASTM C94 "Specification for Ready Mixed Concrete."

B. Lightweight Concrete

1. Lightweight concrete shall be batched and mixed as recommended by the concrete supplier to achieve accurate volume and the necessary quality.

2. Aggregate storage conditions, batching, and mixing procedures shall prevent premature slump loss of the concrete during delivery and discharge.

C. Mixing Water Control

1. Concrete which arrives at the jobsite with slump below that specified for placement may be adjusted by the addition of water to increase slump, provided the maximum slump is not exceeded and the maximum water content of the design mix is not exceeded. Following any such water addition, the concrete shall be mixed at mixing speed for at least 30 revolutions of the drum.

2. After adjustment is made to the proper slump, the concrete shall be discharged as long as it retains its placeability without the further addition of water.

3. Concrete shall be placed within one and one half hours after mixer is charged in average conditions. Time shall be reduced to one hour during hot weather concreting.

2.9 SOURCE QUALITY CONTROL

A. Testing will be performed under the provisions of Section 01 40 00, except as otherwise specified.

B. Independent Testing Laboratory, approved by Architect and employed by Contractor, is responsible for:

1. Testing aggregate as follows at start of work and whenever change in aggregate source occurs:

a. Gradation and fineness modulus: ASTM C136.

b. Specific gravity: ASTM C127 for coarse aggregate, ASTM C128 for fine aggregate.

c. Organic impurities: ASTM C40.

d. Effect of organic impurities on strength: ASTM C87 for effect of organic impurities on strength.

e. Potential reactivity of aggregate: ASTM C295, petrographic examination.

f. Soundness: ASTM C88.

g. Reports of tests conducted on aggregates from the same source within the past 12 months will be acceptable.

2. Testing concrete mixes as follows at start of work and whenever change in materials source occurs:

a. Prepare mix designs, test concrete strength, and report results if trial batch method is used to establish design mix proportions. Mix design shall be reviewed, approved, sealed and stamped by a Licensed Professional Engineer in the state where the project is located.

C. Independent Testing Laboratory, employed by Owner, is responsible for observing and evaluating the following at batch plant at start of Work and at other times as requested by the Architect:

1. Condition of batching equipment.

2. Conformance with design mix proportions.

3. Storage of materials.

4. Mixing equipment.

5. Mixing and transporting equipment.

6. Other testing to verify compliance if requested by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions and proceed with Work in accordance with Section 01 70 00.

B. Verify forms, reinforcement, anchors, plates, joint materials, vapor retarder and other items to be cast into concrete are accurately placed and held securely.

C. Verify forms are free of debris and water.

D. Verify excavations are free of loose material and water.

3.2 TESTING

A. Concrete materials and operations shall be tested and inspected for compliance with the specifications and requirements. Strength Tests of concrete shall be in conformance with 2010 CBC, Sections 1905A.1.1 and 1905A.6.

3.3 TESTING AGENCY

A. The testing agency shall be designated by the Owner. Ample time shall be allowed for preliminary tests as required prior to concreting operations.

B. All testing agency personnel shall meet the requirements of ASTM E329, "Recommended Practice of Inspecting and Testing Agencies for Concrete and Steel in Construction."

C. All testing agency personnel shall have the knowledge and ability to perform the necessary tests equivalent to the minimum guideline for Certification of Concrete Field Testing Technicians, Grade 1 in accordance with ACI CP-2.

3.4 DUTIES AND SERVICES

A. The duties and responsibilities of the testing agency and the contractor and services to be performed by each are as designated in ACI 301, Chapter 16, "Specifications for Structural Concrete for Buildings."

3.5 EVALUATION AND ACCEPTANCE

A. Test results of standard cylinders, molded, cured, and tested according to ASTM C31 and C39 should be evaluated separately for each concrete mix according to ACI 214, "Recommended Practice for Evaluation of Concrete Compression Test Results of Field Concrete."

B. The criteria for acceptance of concrete shall be as detailed in ACI 318, Chapter 5, Section 5.6, "Evaluation and Acceptance of Concrete" or as per ASTM C94, Section 17 "Strength" and Section 18 "Failure to Meet Strength Requirements."

C. As referenced in ASTM C94 – Section 4.4, "When the strength of concrete is used as a basis for acceptance, the manufacturer shall be entitled to copies of all test reports."

3.6 PREPARATION

A. Construction Joints:

1. Clean previously placed concrete of laitance.

2. Clean reinforcement and accessories of mortar from previous concrete placement operations.

3. Apply bonding agent in accordance with manufacturer's recommendations.

4. Moisten surface of previously placed concrete.

3.7 PLACEMENT

A. Place concrete according to ACI 301 and 304R, except as modified and supplemented on Drawings or in this Section.

B. Notify Architect, Inspector of Record, and Owner's testing laboratory in writing according to Inspection request documents a minimum of 72 hours prior to commencement of placing operations.

C. Cold Weather Concreting:

1. Comply with requirements of ACI 306.1.

2. Do not place concrete when ambient air temperature is expected to fall below 40 degrees F within 24 hours, except with prior written approval of Architect.

3. Remove frost, ice, and snow from formwork, reinforcing, and accessories prior to placing concrete.

4. Do not place concrete foundations, footings or slabs on frozen ground.

5. Limit concrete temperature at time of discharge to 55 degrees F for sections less than 12 inches in any dimension and to 50 degrees F for other sections.

D. Hot Weather Concreting:

1. Comply with requirements of ACI 305R when ambient air temperature exceeds 75 degrees F.

2. Use water-reducing, retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions to extend setting time to limits specified as approved by Architect.

3. Cool aggregates, cool mixing water, substitute ice for part of mixing water, or take other measures to limit concrete temperature at time of discharge to 90 degrees F.

4. Cover reinforcing steel and steel forms with water soaked burlap or use fog spray to limit temperature of steel to 120 degrees F immediately prior to concrete placement.

5. Use evaporation retardant between finishing passes.

E. At time of placement, provide concrete temperature between 50 degrees F and 90 degrees F.

F. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

G. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.

H. Separate slabs on grade from vertical surfaces with joint filler.

I. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

J. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07 90 05 for finish joint sealer requirements.

K. Install joint devices in accordance with manufacturer's instructions.

L. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

M. Apply sealants in joint devices in accordance with Section 07 90 05.

N. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

O. Place concrete continuously between predetermined expansion, control, and construction joints.

P. Do not interrupt successive placement; do not permit cold joints to occur.

Q. Place floor slabs in pattern indicated.

R. Saw cut joints within 12 hours after placing.

S. Screed floors level, maintaining surface flatness of maximum 1/4 inch in 10ft.

T. Maintain surfaces receiving concrete at approximately same temperature as concrete being placed.

U. Maintain surface of hardened concrete below 100 degrees F.

V. Convey concrete from mixer to place of deposit by method that will prevent segregation or loss of material, and that will not require addition of water to produce desired slump at point of placement. Do not use supported reinforcing as runway base for concrete conveying equipment.

W. Depositing:

1. Deposit concrete as nearly as practicable to its final location.

2. Place concrete continuously between construction joints.

3. Deposit concrete in layers not exceeding 24 inches in depth.

4. Avoid inclined layers.

5. Place each layer while preceding layer is still plastic.

6. Do not allow free fall of concrete to exceed 4 feet. Do not allow free fall of concrete containing high-range water reducing admixture to exceed 10 feet.

7. Drop concrete in vertical direction, not at incline.

8. If forms and reinforcing above level of concrete already in place become coated with accumulations of hardened or partially hardened concrete, remove accumulations before proceeding.

9. Place concrete without displacing reinforcing and accessories.

X. Consolidation:

1. Vibrate concrete to eliminate formation of surface air voids, honeycombs and sand streaks.

2. Use mechanical, internal vibrators with proper frequency, rpm, and spud size. Select spud for size and spacing of reinforcement and clearance to formwork. Supplement vibration by hand-spading, rodding, or tamping.

3. Insert and withdraw vibrator vertically at spacing not to exceed 1-1/2 times radius of action of vibrator, maximum of 24 inch centers.

4. Insert vibrators into placed layer and at least 6 inches into preceding layer.

5. Do not allow vibrator to touch form face or embedded items.

6. Do not use mechanical vibration for slabs less than 4 inches thick. Use hand spading and tamping in these locations.

Y. Placing Concrete Slabs:

1. Deposit and consolidate concrete slabs in continuous operation, in single layer, within limits of construction joints, until placing of panel or section is completed.

2. Bring slab surfaces to correct level with straightedge and strike-off.

3. Use bull floats, highway straight edges, or darbies to produce smooth surface, free of humps or hollows before bleed water appears on surface.

4. Do not disturb slab surfaces prior to beginning finishing operations.

Z. Non-Structural Concrete Topping:

1. Placement on same day:

a. Place and consolidate base slab.

b. Screed to elevation to allow for topping slab thickness.

c. After bleed water has disappeared and surface will support worker's weight without indentation, place topping mixture, compact, float and finish.

2. Placement after one day:

a. Place and consolidate base slab.

b. Brush partially set surface with wire broom to remove laitance and scratch surface.

c. Wet cure base slab at least three days.

d. Immediately, prior to placing topping, clean base slab and dampen surface.

e. Scrub bonding grout into base slab surface, or apply bonding agent in accordance with manufacturer's recommendations.

f. Rewettable bonding agent may be used only in areas not subject to wet conditions.

g. Place topping slab before grout has set or dried, compact, float and finish.

M. Curbs and Equipment Pads:

1. Form curbs and equipment pads in areas indicated.

2. Placement on same day:

a. Place and consolidate base slab.

b. Screed to elevation to allow for curb/pad thickness.

c. After bleed water has disappeared and surface will support worker's weight without indentation, place curb/pad concrete mixture, compact, and float.

3. Placement after one day:

a. Place and consolidate base slab.

b. Brush partially set surface with wire broom to remove laitance and scratch surface.

c. Wet cure base slab at least three days.

d. Immediately, prior to placing curb/pad concrete, clean base slab and dampen surface.

e. Scrub bonding grout into base slab surface, or apply bonding agent in accordance with manufacturer's recommendations.

f. Place curb/pad concrete before grout has set or dried, compact and float.

4. Finish interior curbs and pads by stripping forms while concrete is still green and steel trowel surfaces to hard, dense finish with corners, intersections and terminations slightly rounded.

3.8 DEPOSITING

A. Concrete shall be continuously deposited. When continuous placement is not possible, construction joints shall be located as approved by the Architect. Concrete shall be deposited as close to its final point of placement as possible.

B. Concrete shall be consolidated by vibration, spading, rodding or forking. Work concrete around reinforcements, embedded items and into corners. Eliminate all air or rock pockets and other causes of honeycombing, pitting or planes of weakness.

C. Internal vibration shall have a minimum frequency with amplitude to consolidate the concrete effectively. See ACI 309, "Recommended Practice for Consolidation of Concrete."

1. Vibrators shall be operated by experienced and competent workmen.

2. Use of vibrators to transport concrete shall not be allowed.

3. Vibrators shall be vertically inserted every 18 inches for 5 to 15 seconds and then withdrawn.

3.9 FINISHING

A. General: Provide finishes at specified locations, unless indicated otherwise.

B. Finishing Formed Surfaces:

1. Rough Form Finish:

a. Leave surfaces with texture imparted by forms, except patch tie holes and defects.

b. Remove fins and other projections exceeding 1/4 inch in height.

c. Locations: Concrete surfaces not exposed to view.

2. Smooth Form Finish:

a. Provide smooth, hard, uniform surface with minimum number of seams.

b. Repair and patch defective areas, fill tie holes, remove fins and other projections completely.

c. Locations: Exposed concrete surfaces or concrete surfaces designated to receive coatings applied directly to concrete, such as waterproofing, dampproofing, plaster, painting, and other similar applied finishes.

3. Smooth Rubbed Finish:

a. Provide smooth rubbed finish to newly hardened concrete, which has already received smooth form finish, not later than one day after form removal.

b. Moisten concrete surfaces and rub with carborundum brick or other abrasive device until uniform color and texture is produced.

c. Do not use cement grout other than cement paste drawn from concrete by rubbing process.

d. Locations: Where scheduled or indicated on Architectural Drawings.

4. Grout Cleaned Finish:

a. Provide grout cleaned finish to smooth form finished concrete which are complete and accessible.

b. Blend one part portland cement with 1-1/2 parts fine sand and mix with 1:1 ratio of bonding admixture and water to achieve consistency of thick paint. Match color of surrounding concrete.

c. Wet surface of concrete sufficiently to prevent absorption of water from grout and apply grout uniformly with brushes or spray.

d. Immediately after applying grout, scrub surface vigorously with cork float or stone to coat surface and fill air bubbles and holes.

e. While grout is still plastic, remove excess grout by working surface with rubber float, sack or other means.

f. After surface becomes white from drying, rub vigorously with clean burlap.

g. Keep surface damp for minimum 36 hours after final rubbing.

h. Locations: Where scheduled or indicated on Architectural Drawings.

5. Cork Float Finish:

a. Remove forms at early stage, not later than 3 days after placement of concrete; ream control joints as indicated on Architectural Drawings.

b. Provide cork float finish to concrete which has already received smooth form finish.
   1) Mix one part portland cement and one part fine sand with sufficient water to produce stiff mortar.
   2) Dampen wall surface.
   3) Apply mortar with firm rubber float or trowel, filling voids.
   4) Compress mortar into voids using slow-speed grinder or stone.
   5) If mortar surface dries too rapidly to permit proper compacting and finishing, apply small amount of water with fog sprayer.
   6) Produce final texture with cork float using swirling motion.
   7) Locations: Where [scheduled] indicated on Drawings.

C. Finishes for Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces, strike-off smooth and finish with texture matching adjacent formed surfaces.

D. Slab Finishes:

1. Floor flatness/levelness tolerances:

a. FF defines maximum floor curvature allowed over 24 inches. Computed on basis of successive 12 inch elevation differentials, FF is commonly referred to as "flatness F-Number."
   FF = 4.57
   Maximum difference in elevation, in inches, between successive 12 inch elevation differences.

b. FL defines relative conformity of floor surface to horizontal plane as measured over 10 feet distance. FL is commonly referred to as "levelness F-Number."
   FL = 12.5
   Maximum difference in elevation, in inches, between two points separated by 120 inches.

c. Measure floors in accordance with ASTM E1155.

d. Ensure slabs achieve specified overall tolerances. Minimum local tolerance (1/2 bay or as designated by Architect) is 2/3 of specified tolerance unless noted otherwise.

2. Float Finish:

a. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating.

b. Begin floating when surface water has disappeared and when concrete has stiffened sufficiently to permit operation of power-driven floats.

c. Cut down high spots and fill low spots.

d. Immediately after leveling, re-float surface to uniform, sandy texture and a FF20/FL17 tolerance.

e. Locations: Surfaces requiring trowel finish [, broom finish] [, slab surfaces covered with insulation] [, waterproofing membrane] [, exposed aggregate finish] [, and] [sand bed terrazzo].

3. Trowel Finish:

a. After float finish, follow by power troweling and then hand troweling.

b. Begin final troweling when surface produces ringing sound as trowel is moved over surface.

c. Finish surface free of trowel marks, uniform in texture and appearance, and to FF25/FL20 elevated slab tolerance.

d. Grind surface smooth to remove defects which may telegraph through applied finish.

e. Locations: Slabs left exposed to view, slabs covered with resilient flooring [,carpet] [, paint] and other similar applied finish.

4. Medium Broom Finish:

a. After float finish, while surface is still plastic, draw fiber bristle broom uniformly over surface to provide texture perpendicular to main traffic or at right angles to floor slope [to match Architect's sample].

b. Locations: Sidewalks, ramps, exterior steps, landings, and platforms.

E. Construction and Control Joints in Slab-on-grade:

1. Construction joints to coincide with planned control joint pattern.

2. Provide joints in at column lines and as indicated on Drawings.

3. Tooling Control Joints and Construction Joints:

a. Slabs Exposed to Vie: Tool joints after finishing slab.

b. Concealed Slabs:
1) Provide joints immediately after final finishing.
2) Use dry-cut sawing system (Soft-Cut) to depth of 1 inch unless noted otherwise; without dislodging aggregates by sawing. Complete sawing no later than two hours after finishing at each control joint location.

3.10 CURING

A. General:

1. Comply with ACI-308, except as modified or supplemented.

2. Start immediately after placing and finishing concrete.

3. Protect from premature drying, temperature extremes, temperature variations, rain, flowing water, and mechanical injury.

4. Cure continuously, without allowing to dry, for minimum period required for hydration of cement and hardening of concrete.

5. Maintain temperature of concrete above 50 degrees F for curing period.

6. Minimum Length of Curing Period:

   a. High Early Strength Concrete: 3 days.

   b. Other Concrete: 7 days.

B. Acceptable Curing Methods:

1. Concrete to receive Waterproofing, Dampproofing, or Membrane Roofing: Moist curing, moisture-retaining sheet covering, or chemical curing compounds.

2. Concrete to receive Hardeners or Sealers: Moist curing, moisture-retaining sheet covering, dissipating resin compounds, or chemical curing compounds; acceptable to manufacturer of hardener or sealer.

3. Concrete to receive Cement Setting Beds, Bonded Toppings: Moist curing, moisture-retaining sheet covering, or chemical curing compounds.

4. Concrete to receive Adhered Finishes: Moist curing, moisture-retaining sheet covering, acrylic curing/sealing compounds, dissipating resin compounds, or chemical curing compounds; acceptable to manufacturer of applied finish.

5. Concrete exposed to Direct Sun when Ambient Temperature Exceeds 75 degrees F: Where permitted, use white pigmented liquid compounds.

6. Other Concrete: Moist curing, moisture-retaining sheet covering, liquid membrane-forming compounds, or chemical curing compounds.

C. Acceptable Curing Procedures:

1. Moist Curing Unformed Surfaces:

   a. Ponding: Maintain 100 percent coverage of water continuously.

   b. Fog Spraying or Sprinkling: Maintain continuously moist with nozzles or sprayers.

   c. Fabric Mats: Cover surfaces with wet burlap or other absorptive material which will not discolor concrete; keep continuously wet.

   d. Sand: Minimum 2 inch thick layer, kept continuously saturated with water, free from deleterious materials which would stain concrete.

2. Sheet Curing Unformed Surfaces:

   a. Wet surface of concrete with fine spray of water prior to applying sheet.

   b. Immediately cover surface with polyethylene sheeting, waterproof paper, or burlap-polyethylene sheet.

   c. Lap edges of sheeting minimum of 12 inches.

   d. Repair damaged sheet.

   e. Ballast sheet to prevent movement and blow-off.

3. Liquid Membrane-forming Compound Curing of Unformed Surfaces:

a. Apply in accordance with manufacturer's recommendations.

b. Protect surfaces from foot and vehicular traffic.

c. Curing compounds used must be compatible with adhesives used in setting carpet, resilient tile or sheeting flooring, and other similar finishes.

4. Curing of surfaces which are moist cured for first 24 hours may be cured by other acceptable methods for remaining curing period provided they are not allowed to become dry.

3.11 FIELD QUALITY CONTROL

A. Field testing will be performed under the provisions of Section 01 45 00.

B. Independent testing laboratory, employed by Owner, is responsible for:

1. Sampling Fresh Concrete: ASTM C172, sample at point of discharge from mixer and additionally at point of discharge from end of pipe for concrete conveyed by pumping methods; if water is added at Project site, obtain another sample for testing.

2. Concrete Temperature: Test each time slump and air content are tested and each time set of compressive strength test specimens is made.

3. Slump: ASTM C143; one test from first truck at point of discharge each day, one test each time set of compressive strength test specimens is made, and when change in consistency occurs.

4. Air Content of Plastic Mix:

a. For Normal Weight, Air Entrained Concrete: ASTM C231, pressure method or ASTM C173, volumetric method.

b. For Lightweight, Air Entrained Concrete: ASTM C173, volumetric method.

c. Make one test each time a set of compressive strength test specimens is made.

5. Compressive Strength Tests:

a. Make and cure test specimens in accordance with ASTM C31, from concrete sampled at point of discharge from mixer and additionally at point of discharge from end of pipe for concrete conveyed by pumping methods.

b. Make one set of 4 test cylinder specimens for every 100 cubic yards, or for every 5000 square feet of slabs and walls, or fraction thereof, of each class of concrete, with at least one set for each class each day.

c. Test cylinders in accordance with ASTM C39, 2 at 7 days for information, and 2 at 28 days for acceptance.

d. When frequency of testing will provide less than five strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches, or from each batch if fewer than 5 are used.

6. Environmental Conditions:

a. When ambient air temperature falls below 40 degrees F, record maximum and minimum air temperature in each 24 hour period; record air temperature inside protective enclosure; record minimum temperature of surface of hardened concrete.

b. When ambient air temperature rises above 85 degrees F, record maximum and minimum air temperature in each 24 hour period; record minimum relative humidity; record maximum wind velocity, and record maximum temperature of surface of hardened concrete.

7. Observe conveying, placement and consolidation of concrete for conformance to Specifications.

8. Observe condition of formed surfaces upon removal of formwork prior to repair of surface defects and observe repair of surface defects.

9. Observe curing procedures for conformance with Specifications, record dates of concrete placement, start of preliminary curing, start of final curing, end of curing period.

10. Observe Preparations for Placement of Concrete:

    a. Inspect handling, conveying, and placing equipment, inspect vibrating and compacting equipment.

    b. Inspect preparation of construction, expansion, and isolation joints.

11. Observe preparations for protection from hot weather, cold weather, sun, and rain and preparations for curing.

12. Observations of Concrete Mixing:

    a. Monitor and record amount of water added at Project site.

    b. Observe minimum and maximum mixing times.

13. Other Inspections:

    a. Grouting under base plates.

    b. Grouting anchor bolts and reinforcing steel in hardened concrete.

14. Verify slab flatness and levelness within 24 hours of placement for each slab finish at slab-on-grade and framed slabs in accordance with ASTM E1155. Perform minimum of 2 tests for each slab and finish; one at initial pour and second randomly chosen by testing laboratory.

C. Evaluation and Acceptance of Concrete:

1. Strength Test: Defined as average strength of two 28 day cylinder tests from each set of cylinders.

2. Acceptance Criteria Based on Strength Tests: Strength level of individual class of concrete is considered satisfactory if both:

    a. Average of three consecutive strength test results equal or exceed required design compressive strength, and

    b. No individual strength test results falls below required design compressive strength by more than 500 psi.

3. Acceptance Criteria Based on Field Tests:

    a. Core Tests: Where strength tests indicate concrete of deficient strength, obtain and test cores in accordance with ASTM C42, ACI 318 and ACI-301, at locations directed by Architect.

b. Strength level of concrete in area represented by core test is considered adequate if complies with the requirements of ACI 318.

c. Fill core holes with low slump concrete or patching mortar used to repair surface defects.

4. Revise concrete mix proportions, curing procedures and protection as necessary to provide concrete conforming to Specifications.

D. Acceptance of Structure:

1. Acceptance of structure for dimensional tolerances, appearance, and strength will be based on ACI-301, Chapter 18.

2. Remove and replace concrete which does not meet acceptance criteria.

3.12 PATCHING AND REPAIRING DEFECTIVE CONCRETE

A. General:

1. Rewettable bonding agent may be used only in areas not subject to wet conditions.

2. Patching compound may only be used for concrete not exposed to view.

B. Repairing Formed Surfaces:

1. Surface Defects Requiring Repair:

a. Color and texture irregularities.

b. Honeycomb, air bubbles, rock pockets, and spalls.

c. Fins, burrs and other surface projections.

d. Cracks.

e. Stains and other discolorations that cannot be removed by cleaning.

2. Patch defective areas and tie holes immediately after removal of forms.

3. Cut out honeycomb, rock pockets, and voids over 1/4 inch down to solid concrete but not less than 1 inch depth.

4. Make edges of cuts perpendicular to concrete surface.

5. Clean and dampen area including 6 inches of surrounding surface with water.

6. Apply bonding grout by brushing into surface, after surface water has evaporated.

7. Place patching mortar or patching compound before grout has set or dried.

8. Compact patching material in place and strike off slightly higher than surrounding surface.

9. Finh after minimum of one hour to match surrounding surface.

10. Flush out form tie holes, fill with patching mortar, patching compound, or precast cement cone plugs secured in place with bonding compound.

11. Cure repair areas by same methods as surrounding concrete or keep continuously damp for 7 days.

C. Repairing Unformed Surfaces:

1. Surface Defects Requiring Repair:
   a. Fine crazing cracks.
   b. Cracks larger than 0.012 inch wide or cracks which penetrate to reinforcing.
   c. Cracks penetrating completely through non-reinforced sections.
   d. Spalling, popouts, honeycomb, and rock pockets.
   e. High and low areas in slabs.

2. Correct high areas in hardened concrete by grinding after concrete has cured at least 14 days.

3. Correct high and low areas during, or immediately after, completion of initial floating operations by cutting high areas and by placing fresh concrete in low areas.

4. Repair defective areas, except isolated random cracks and single holes not exceeding 1 inch diameter, by cutting out and replacing with patching mortar or patching compound.
   a. Remove defective areas to sound concrete with clean, square cuts.
   b. Dampen concrete surfaces in contact with patching material and apply bonding grout by brushing into surface, after surface water has disappeared.
   c. Place patching mortar or patching compound before grout has set or dried.
   d. Compact and finish to blend with adjacent finished concrete.
   e. Cure in same manner as adjacent concrete.

5. Repair isolated random cracks and single holes not over 1 inch diameter with patching mortar.
   a. Groove top of cracks and cut out holes to sound concrete and clean area.
   b. Dampen cleaned surfaces and apply bonding grout by brushing into surface, after surface water has disappeared.
   c. Place patching material before bonding grout is set or dry.
   d. Compact in place and finish to match adjacent concrete.
   e. Keep patched area continuously moist for not less than 72 hours.

D. Structural Repairs: Contractor shall proposed materials, methods, and procedures to the Architect for review and approval prior to proceed with structural repairs.

3.13 PROTECTION

A. Protect finished work in accordance with Section 01 70 00.

B. Protect concrete from construction traffic, weather, or mechanical damage for 14 days after placing.

C. Provide raised runways for traffic areas.

D. Protect concrete from staining.

END OF SECTION

SECTION 03 45 00

PRECAST ARCHITECTURAL CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Architectural precast concrete wall caps.

B. Supports, anchors, and attachments.

C. Intermediate and perimeter joint seals.

D. Grouting under panels.

1.02 SUBMITTALS

A. See Section 01 33 13 - Submittal Procedures.

B. Product Data: Manufacturer's information on accessory products, including pigments, admixtures, inserts, plates, etc.

C. Shop Drawings: Indicate layout, unit locations, configuration, unit identification marks, reinforcement, connection details, support items, location of lifting devices, dimensions, openings, and relationship to adjacent materials.

1. Include details of mix designs.

D. Samples: Submit two cap samples, full size width and height by 16 inches long in size, illustrating surface finish, color and texture.

E. Fabricator qualifications.

1.03 QUALITY ASSURANCE

A. Design Engineer Qualifications: Design precast concrete units under direct supervision of a Professional Structural Engineer experienced in design of precast concrete and licensed in California.

B. Fabricator Qualifications:

1. Firm having at least 5 years of documented experience in production of precast concrete of the type required.

C. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Handling: Lift and support precast units only from support points.

B. Blocking and Lateral Support During Transport and Storage: Use materials that are clean, non-staining, and non-harmful to exposed surfaces. Provide temporary lateral support to prevent bowing and warping.

C. Protect units to prevent staining, chipping, or spalling of concrete.

D. Mark units with date of production in location that will be concealed after installation.

PART 2 PRODUCTS

2.01 PRECAST UNITS

A. Precast Architectural Concrete Units: Comply with PCI MNL-120, PCI MNL-122, PCI

MNL-123, PCI MNL-135, and ACI 318.

1. Design Loads: Static loads, anticipated dynamic loading, including positive and negative wind loads, thermal movement loads, and erection forces as required by California Building Code.
2. Calculate structural properties of units in accordance with ACI 318.
3. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with strength and appearance requirements.
4. Accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
5. Provide connections that accommodate building movement and thermal movement and adjust to misalignment of structure without unit distortion or damage.

B. Finish Type A: Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance.

2.02 REINFORCEMENT

A. Comply with requirements of Section 03 20 00.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I - Normal Portland type.

B. Lightweight Structural Aggregate: ASTM C330.

C. Water: Clean and not detrimental to concrete.

D. Fiber Reinforcement: Synthetic fiber shown to be resistant to long-term deterioration when exposed to moisture and alkalis; 1/2 inch length.

E. Admixtures: Air entrainment as specified in Section 03 30 00.

F. Grout:

1. Non-shrink, non-metallic, minimum 10,000 psi, 28 day strength.
2. Epoxy.

2.04 SUPPORT DEVICES

A. Connecting and Support Devices: ASTM A36/A36M steel; hot-dip galvanized in accordance with ASTM A153/A153M.

1. Clean surfaces of rust, scale, grease, and foreign matter.
2. Galvanize after fabrication in accordance with requirements of ASTM A123/A123M. B.

Bolts, Nuts, and Washers: ASTM A307 heavy hex bolts, Type A, hot-dip galvanized, with matching ASTM A563 (A 563M) nuts and matching washers.

C. Primer: Zinc rich type.

2.05 ACCESSORIES

A. Bearing Pads: High density plastic; Shore A Durometer as recommended by fabricator; 1/8 inch thick, smooth both sides.

B. Sealant: SJ-1 type specified in Section 07 90 05.

2.06 FABRICATION

A. Fabricate in conformance with PCI MNL-117 and PCI MNL-135.

B. Maintain plant records and quality control program during production of precast units. Make records available upon request.

C. Use rigid molds, constructed to maintain precast unit uniform in shape, size, and

finish. D. Use form liners in accordance with manufacturer's instructions.

E. Maintain consistent quality during manufacture.

F. Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items.

G. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.

H. Minor patching in plant is acceptable, providing structural adequacy and appearance of units is not impaired.

2.07 FABRICATION TOLERANCES

A. Conform to PCI MNL-117 and PCI MNL-

135. PART 3 EXECUTION

3.01 ERECTION

A. Erect units without damage to shape or finish. Replace or repair damaged

panels. B. Erect units level and plumb within allowable tolerances.

C. Align and maintain uniform horizontal and vertical joints as erection progresses.

D. When units require adjustment beyond design or tolerance criteria, discontinue affected work; advise tBP/Architecture.

E. Fasten units in place with mechanical

connections. F. Fasten units in place with mortar.

G. Exposed Joint Dimension: 1/2 inch. Adjust units so that joint dimensions are within

tolerances. H. Seal perimeter and intermediate joints in accordance with Section 07 90 05.

3.02 TOLERANCES

A. Erect members level and plumb within allowable tolerances. Conform to PCI MNL-135.

END OF
SECTION