



**R. D. WHITE ELEMENTARY SCHOOL
NEW CLASSROOM BUILDING
PHASE 2 (PLAYGROUND)**

Prepared by Architecture 9 PLLLP



REVISED
 APPROVED
 DIV. OF THE STATE ARCHITECT
 LOS ANGELES BASIN REGIONAL OFFICE
 AC N.V. FLS _____ SS _____
 APPL NO. 03-14340 DATE 11/9/2015

SPECIFICATIONS

Project:	R. D. White Elementary School New Classroom Building
District:	GLENDALE UNIFIED SCHOOL DISTRICT 223 North Jackson Street Glendale, California 91206
Architect:	Architecture 9 PLLLP 8816 Foothill Boulevard #103-224 Rancho Cucamonga, California 91730



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2998

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GLENDALE UNIFIED SCHOOL DISTRICT

R. D. WHITE ELEMENTARY SCHOOL
NEW CLASSROOM BUILDING

DECEMBER 21, 2011 REVISED 12/10/14

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Architecture 9 Drawings A0.1, dated revised June 6, 2017; A0.4c, dated revised June 6, 2017; C1.3, dated revised July 16, 2014; C2.3, dated revised July 16, 2014; A1.2, dated revised June 6, 2017; A1.10b, dated revised June 6, 2017; A1.11, dated revised June 6, 2017; A1.20, dated revised June 6, 2017; A1, dated June 6, 2017; L2.A, dated revised June 6, 2017; L2.2, dated revised August 14, 2015 and L2.3, dated revised June 14, 2015.

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:

R. D. WHITE ELEMENTARY SCHOOL
NEW CLASSROOM BUILDING
744 East Doran Street
Glendale, California 91206

- 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 (\$30,000.00) 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

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.

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 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, stored, 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
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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: _____

GLENDALE UNIFIED SCHOOL DISTRICT

For use by the Architect:

Accepted Accepted as noted

SUBSTITUTIONS AND PRODUCT OPTIONS
01 25 00-4

Firm: _____

Not Accepted Received too late

Address: _____

By: _____

Date: _____

Date: _____

Remarks: _____

Telephone: _____

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 unforeseen 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 R. D. White Elementary School 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 Planning, Development and Facilities, Facility 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 Planning, Development and Facilities, Facility 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 and approve minutes of previous meeting.
 2. Review of work progress since previous meeting.
 3. Review of upcoming work to take place in project schedule.
 4. Discuss School Site concerns with regard to safety, paths of travel, and any upcoming events that may affect the work schedule.
 5. Discuss field observations, problems, and decisions, affecting the work.
 6. Review submittals schedule and status of submittals.
 7. Review status of proposed substitutions, 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 Planning, Development and Facilities, Facility 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 as needed.

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 RFI log. 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 RFI log 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.

PART 2 PRODUCTS-NOT USED.

PART 3 EXECUTION- NOT

USED.

END OF
SECTION

SECTION 01 32 16

SCHEDULES AND REPORTS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Coordinate both the listing and timing of reports and other activities required by provisions of this and other Sections, so as to provide consistency and logical coordination between the reports. Maintain coordination and correlation between separate reports by updating at monthly or shorter time intervals. Make monthly distribution of the progress schedule and update to all parties involved in the work including the Architect, Inspector, and Project Manager, along with the Request/Application for Payment. In particular provide definition and coordination of the progress schedule, with phases, changes, schedule of values, funding sources and progress reports.
- B. CPM Schedule: Secure critical time commitments for performing major elements of the work of no longer than 60-day increments. Within 30 days after the Notice to Proceed, submit a comprehensive CPM chart progress schedule indicating, by stage-coded symbols, milestones for each major specification section, category, or unit of work to be performed; include minor elements of work, which are, nevertheless, involved in overall sequencing of the work. Include dates for completion of each phase of work. Arrange schedule to show graphically the major sequences of work necessary for the completion of related elements of work. Arrange the schedule to allow for the Architect's review of submittals as well as procedure for certification of substantial completion. Prepare and maintain the schedule on a sheet of sufficient width (or a series of sheets) to show the required data clearly for the entire construction time. Prepare the schedule on sheets of stable transparency, or other reproducible material, to permit reproduction for the required distribution.
- C. Daily Reports: Prepare a daily report, recording the following information concerning events at the site; make available to the Inspector for on-site review and submit duplicate copies to the Inspector and Architect upon request:
1. List of Contractor personnel at the site
 2. List of Subcontractors at the site
 3. Accurate Count of personnel at the site by trade, and Subcontractor
 4. Material and Equipment Deliveries
 5. High/low temperatures, and general weather conditions.
 6. Accidents or injuries.
 7. Meetings and significant decisions.
 8. Unusual events.
 9. Stoppages, delays, shortages, losses.
 10. Emergency procedures, field orders.
 11. Orders/requests by governing authorities, signed.
 12. Services connected, disconnected.
 13. Equipment or system tests and start-ups.
 14. Partial completions, occupancies.
 15. Substantial completion requested.
 16. Substantial completion authorized.
 17. Requests for Inspections
- D. Progress Reports: Contractor shall submit "Verified Reports", on prescribed form, of construction per requirements of Title 24, CCR.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 - EXECUTION - NOT APPLICABLE

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Procedures for submitting to the Architect, shop drawings, product data, samples, and material lists required by specification section and procedures for submitting hardware lists to the District.

1.02 RELATED SECTIONS:

- A. Section 013216: Schedules and Reports.
- B. Submittal of guarantees, warranties, certificates, operation and maintenance manuals and as-built drawings: Section 017700, Contract Close-Out.
- C. Submittals: See Respective Specification Sections.

1.03 PROCEDURES:

- A. At the start of the project the Contractor shall review the documentation required for Project Completion. This shall include documentation requested by the Architect: Shop drawings, manufacturer's catalogs, samples, warranties, operation and instruction manuals.
- B. The Contractor shall, during the course of the project, secure, review and approve, and submit the required documentation to the Architect for review and approval.
- C. After the Architect has date-stamped, signed and reviewed the submittals, with corrections noted if any, the Architect will transmit submittals to Contractor and if not rejected, to the District Inspector.

1.04 CONTRACT:

- A. Furnish simultaneously the following number of executed copies of:
 - 1. Agreement: Five (5).
 - 2. Performance Bond: Five (5).
 - 3. Payment Bond: Five (5).
 - 4. Certificate - Workmen's Compensation: Six (6).
 - 5. Certificates showing "Proof of Carriage of Insurance" required by General Conditions: Six (6).
 - 6. Non-Collusion Affidavit: Six (6).

1.05 SUBMITTALS; GENERAL:

- A. Deliver all submittals to the Architect. Identify project name and address, telephone number of Contractor, subcontractor and supplier. Identify, as appropriate, the pertinent drawing sheets, detail numbers and Specification Section numbers. Clearly identify any deviations from contract documents. Number submittals using the appropriate specification section, and a hyphen, then the number of the submittal, in sequence.

- B. Make submittals in accordance with approved Construction Schedule in sequence that avoids delaying work and the progress of other Contractors.
- C. Contractor shall thoroughly review; make coordination corrections, date and sign submittals prior to transmitting to Architect, specifically noting relative deviations from the Contract Documents.
- D. Timing of Submittals:
 - 1. Contractor shall submit required submittals in a timely manner, according to the construction schedule, allowing time for the Architect and related MEP or Structural Engineer's, or DSA Inspector's review, for the project and/or each respective Phase of Construction.
 - 2. Contractor shall submit ALL required submittals for the project/phase not less than thirty-five (35) calendar days before the product/material is required for inclusion in the construction of the project beginning with the District's Notice to Proceed. Failure to meet the 35 day requirement shall result in a \$160.00 per calendar day for each submittal not submitted in order to compensate for any necessary expedited review by A&E/Inspector. Submittals shall be complete and shall meet the requirements of the Contract Documents or they shall be considered invalid and the penalty shall apply. The contractor shall submit submittals earlier than the 35 day requirement if the project schedule requires. The contractor shall allow for the Architect's contract review time in order to return the Submittal to the contractor. The Submittals shall be related to the work progress, and shall be so organized as to allow sufficient time for mailing, reviewing, corrections, resubmission and re-reviewing.
 - 3. The Contractor shall coordinate the submittal of related items with their respective sub contractors.
 - 3. In scheduling, allow at least ten (10) full working days for Architect's review following receipt of the submittal. For Mechanical, Plumbing, Electrical, Structural and other submittals that require joint review, allow a minimum of fifteen (15) full working days following receipt of submittal.
- E. Each submittal shall be accompanied by a letter of transmittal containing a complete itemized and numbered list of the submitted materials. Separate letters of transmittal shall accompany each submittal from different specification sections.
- F. Resubmission: If requested, resubmit submittals in a timely manner. Resubmit as specified for initial submittal but identify as such with a sequential alphabetical character. Indicate any changes that have been made other than those requested by Architect.

1.06 SUBSTITUTIONS:

- A. Contractor shall provide specified manufacturer's products unless:
 - 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. Contractor shall submit request for substitutions in accordance with the General Conditions.

1.07 SHOP DRAWINGS:

- A. Shop Drawings are original drawings prepared by the Contractor, subcontractor, supplier, or distributor, which illustrate some portion of the work by showing fabrication, layout, setting, or erection details. Reproductions in whole or in part of the contract drawings shall not be part of the shop drawings.
- B. Make shop drawings accurately to scale and sufficiently large to show all pertinent assembly features and methods of connection.
- C. Copies Required and Distribution: Unless otherwise indicated, submit six (6) sets of drawings, and one electronic copy of the shop drawings in pdf. The Architect will retain two sets, two will be returned to the Contractor, one to the District Project Manager and, one to the District Inspector. In some cases, contractor will be required to submit more than six copies. In such cases the actual number of sets required shall be as stated in the individual specification sections.

1.08 PRODUCT DATA:

- A. Manufacturer's Standard Schematic Drawings:
 - 1. Delete information, which is not applicable to Project. Failure to do so shall be grounds for rejecting the entire submittal.
 - 2. Supplement standard Drawings to provide additional information applicable to Project.
- B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data:
 - 1. Clearly mark each copy to identify pertinent materials, products, or models in terms of this contract.
 - 2. Delete information, which is not applicable to Project. Failure to do so shall be grounds for rejecting the entire submittal.
 - 3. Show dimensions and clearances required.
 - 4. Show performance characteristics and capacities.
 - 5. Show wiring diagrams and controls.
- C. Copies Required and Distribution: Submit six (6) copies and one electronic copy in pdf. The Architect will retain two copies, two will be returned to the Contractor and two to the District Inspector.

1.09 SAMPLES:

- A. Samples:
 - 1. Submit samples of sufficient size and quantity to clearly illustrate:
 - a. Functional characteristics of product or material, with integral parts and attachment devices.
 - b. Full range of colors, textures, and patterns as required by this contract.
 - 2. Provide permanent identification for each sample.

3. Color and pattern: Whenever a choice of color or pattern is available in a specified product, submit accurate color chips and pattern charts to the Architect for review and selection.
 4. Number Required: Submit four of each. Architect and District will retain one each, one will be returned to the Contractor and one to the District Inspector. Additional samples shall be provided Architect at no cost for sample color boards if requested.
- B. Field Samples and Mockups: When specified, erect field samples and mock-ups at the project site to illustrate materials, equipment, or workmanship and to establish standards by which completed work is judged.
- C. After return of office samples or review of field samples, these items may be used in the construction of the project with the approval of the Architect.

1.10 COLOR SCHEDULES:

- A. Following appropriate submittals by the Contractor, the District shall review and approve the color schedules prepared by the Architect, who will distribute the approved schedules to the Contractor and District Inspector.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Regulatory requirements pertaining to the Work and is supplementary to all other regulatory requirements mentioned or referenced elsewhere in the Contract Documents.

1.02 REQUIREMENTS OF REGULATORY AGENCIES:

All pertaining statutes, ordinances, laws, rules, codes, regulations, standards, and the lawful orders of all public authorities having jurisdiction of the Work are hereby incorporated into these Contract Documents the same as if repeated in full herein and such are intended where any reference is made in either the singular or plural to Code or Building Code unless otherwise specified including, without limitation, those in the list below. Contractor shall make available at the site such copies of the listed documents applicable to the Work as the Architect or Owner may request including mentioned portions of the California Administrative Code (CAC).

- A. With respect to the Division of the State of Architect and State Fire Marshal, Uniform Building Code, most-recent adopted Edition.
- B. Building Standards Administrative Code, Part 1, Title 24 C.C.R., latest Edition.
- C. California Building Code (CBC), Part 2, Title 24, C.C.R. (Uniform Building Code volumes 1-3 and California Amendments) Latest Editions.
- D. California Electrical Code (CEC), Part 3, Title 24, C.C.R. (National Electrical Code and California Amendments) Latest Editions
- E. California Mechanical Code (CMC), Part 4, Title 24 C.C.R. (Uniform Mechanical Code and California Amendments) Latest Editions
- F. California Plumbing Code (CPC), Part 5, Title 24 C.C.R. (Uniform Plumbing Code and California Amendments) Latest Editions
- G. California Fire Code, Part 9, Title 24 C.C.R. (Uniform Fire Code and California Amendments) Latest Editions.
- H. California Referenced Standards, Part 12, Title 24, C.C.R., Latest Edition
- I. California Energy Code, Part 6, title 24, C.C.R., Latest Edition
- J. Title 19 C.C.R. Public Safety, State Fire Marshal Regulations, Latest Editions and Amendments
- K. State and Local Public Health Codes, Latest Editions and Amendments
- L. Other statutes, ordinances, laws, regulations, rules, orders, and codes specified in other Sections of the Specifications or bearing on the Work.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

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 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. 1): 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:

A. General: Tests and inspections are referenced to 2010 CBC Sections.

TITLE 24, PART 2 (2010 CBC) - VOLUME 2

TESTS AND INSPECTION REQUIREMENTS	CBC SECTION
FOUNDATIONS & RETAINING WALLS	
CHAPTER 18 A	
1. INSPECTION:	
• PILES	1704A.8
• PIER FOUNDATIONS	1704A.9
CONCRETE	
CHAPTER 19A	
1. MATERIALS	
• PORTLAND CEMENT	1704A.4.1; 1916A.1
• CONCRETE AGGREGATES	1704A.4.1; 1903A.3
• SHOTCRETE AGGREGATES	1913A.3
• REINFORCING BARS	1704A.4.1; 1916A.2
• PRESTRESSING STEEL AND ANCHORAGE	1704A.4.1; 1916A.3
2. QUALITY	
• PROPORTIONS OF CONCRETE	1905A.2; 1905A.3; 1905A.4
• STRENGTH TESTS OF CONCRETE	1905A.1.1; 1905A.6
• SPLITTING TENSILE TESTS	
• SHOTCRETE PROPORTIONS	1913A.2
• SHOTCRETE CORES	1913A.5
• COMPOSITE CONSTRUCTION CORES	1916A.4
• GYPSUM CONCRETE STRENGTH TEST	1914A; 1916A.6
3. INSPECTION	
• JOB SITE	1905A.7
• BATCH PLANT	1704A.4.2
• WAIVER OF BATCH PLANT	1704A.4.3
• PRESTRESSED CONCRETE	1704A.4.4
• SHOTCRETE	1704A.17; 1913A
• REINFORCING BAR WELDING	1903A.7; Table 1704A.3
• POST-INSTALLED ANCHORS IN CONCRETE	1916A.7
LIGHT WEIGHT METALS	
CHAPTER 20A	
1. MATERIALS	
• ALLOYS	2002.1
• IDENTIFICATION	2002.1
2. INSPECTION	
• WELDING	2003.1

MASONRY	
CHAPTER 21A	
1. MATERIALS	
• MASONRY UNITS	2103A.1
• PORTLAND CEMENT, LIME	2103A
• MORTAR AND GROUT AGGREGATE	2103A.8; 2103A.12; 2103A.12.3
• REINFORCING BARS	2103A.13
2. QUALITY	
• PORTLAND CEMENT TESTS	1916A.1
• MORTAR AND GROUT TESTS	2105A.2.2.1.4
• MASONRY PRISM TESTS	2105A.2.2.2
• MASONRY CORE TESTS	2105A.4
• MASONRY UNIT TESTS	2105A.2.2.1
• REINFORCING BAR TESTS	1916A.2
3. INSPECTION	
• REINFORCED MASONRY	1704A.5
• REINFORCED BAR WELDING	1704A.3.1.3; 1903A.7
STEEL	
CHAPTER 22A	
1. MATERIALS	
• STRUCTURAL STEEL	2205A.1
• COLD FORMED STEEL	2209A.1
• IDENTIFICATION	2203A.1
2. QUALITY	
• TESTS OF STRUCTURAL AND COLD FORMED STEEL	2210A.1
• TESTS OF HIGH STRENGTH BOLTS, NUTS WASHERS	2212A.1
• TESTS OF END WELDED TESTS	2212A.2
• STEEL JOISTS	2206A; 1704A.3.2.1
• NON-DESTRUCTIVE WELD TESTS	1704A.3.1
3. INSPECTION	
• SHOP FABRICATION	1704A.2; 1704A.3
• WELDING	1704A.3.1
• NELSON STUD WELDING	1704A.3
• HIGH STRENGTH BOLT INSTALLATION	1704A.3.3

WOOD	
CHAPTER 23	
1. MATERIALS	
• LUMBER AND PLYWOOD	2303.1
• GLUED LAMINATED MEMBERS	2303.1.3
2. INSPECTION	
• GLUED LAMINATED FABRICATION	1704A.6.3.1; 2303.1.3
• TIMBER CONNECTIONS	1704A.6.4
• MANUFACTURED TRUSSES	1704A.6.2; 1704.6.3.2; 2303.4.7

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 made 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 attendance by contractor name, workmen name and trade, in attendance on the project that day.**
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 25

OBSERVATION OF WORK

PART 1-GENERAL

The District will provide a Project Inspector, or Inspector of Record (IOR) for this project.

Contractor shall submit an Inspection Request Form to the Project Inspector (IOR) at least 48 hours prior to the time the inspection is needed, and on the form required. Contractor shall not cover any work requiring inspection until the Project Inspector (IOR) has inspected and approved the subject work.

For work not in conformance with the Contract Documents, the Project Inspector (IOR) shall submit to the Contractor a Deviation/Nonconforming Notice.

PART 2- PRODUCTS - NOT USED

PART 3 – EXECUTION - NOT USED

END OF SECTION

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SECTION 01 50 00

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Temporary utilities, construction trailers/facilities and project sign(s) which are to be provided and maintained by the Contractor.
- B. Dust and noise control.
- C. General temporary items including staging area for material delivery and safety and security lighting.

1.02 TEMPORARY UTILITIES:

A. Water:

- 1. Arrange for water with District Construction/Project Manager and install all necessary water lines, connections and metering devices for project, and upon completion of the work, remove such temporary facilities.
- 2. District will pay for all water needed for construction. Water conservation techniques are to be observed by all workmen. Contractor is to provide and maintain all water conveyance equipment, hoses, nozzles, hose bib connections, free from leaks, and equip all hoses with positive closing, hand-squeeze-type operating nozzles - - it is not permitted to operate a hose without a positive closing nozzle.
- 3. Provide suitable drainage system, subject to the approval of the Architect/Engineer and as indicated on the approved SWPPP, to carry construction waste water from site to an approved disposal location.

B. Electricity:

- 1. District will pay for all electricity needed for construction. Contractor is to arrange for and install all necessary temporary poles, wiring and metering devices and, upon completion of the work, remove such temporary facilities. Electricity conservation best management practices shall be observed by all workmen, and any unnecessary lighting, or electrical discharge shall be turned off at the end of each shift. Only safety lighting is allowed after each shift is concluded.
- 2. Furnish and install area distribution boxes, so located that the individual trades may use 100 foot maximum length extension cords to obtain adequate power and work task lighting, at points where required for the work, for inspection and for safety.
- 3. Provide all electricity needed for construction including connections for construction equipment requiring power.
- 4. Lighting in the construction work area shall be sufficient to allow safe travel for workmen and the Architectural team during normal working hours of the project, and shall be shut down to conserve energy after normal construction working hours.

- C. Natural Gas: The Contractor shall provide and install gas equipment and piping necessary to perform his work, and shall remove same upon completion of the work. **The Contractor shall pay for the Natural gas used in the work.**

- D. Telephone/Communications/Data:
 - 1. Make necessary arrangements and pay costs for installation and operation of telephone, communication, or data service to the Contractor's office at the site.
- E. Use all means necessary to maintain temporary facilities and controls in proper and safe condition throughout progress of the work.
- F. Make required connections to existing utility systems with minimum disruption to services in the existing utility systems. When disruption of the existing service is required, do not proceed without the Architect and/or Inspector's approval with at least 72 hours written request and approval. When required, provide alternate temporary service, should it be necessary as deemed by the Architect and/or Inspector, or Project Manager.

1.03 CONTRACTOR'S FACILITIES:

Contractor shall provide temporary offices, storage sheds, fencing, barricades, signage, hoists, scaffolds, railings and other facilities as required and specified. Installation and maintenance of such items shall be the responsibility of the Contractor.

A. Temporary Offices for Contractor, the District Project Manager and District Inspector of Record.

- 1. The contractor shall provide and maintain two trailers on the site for the duration of the project, up to and including the date the Certificate of Occupancy will be filed by the District with the Board of Education.
- 2. One trailer shall be for the use of the general contractor, and the other trailer shall be for the use of both the District Project Manager, and the District IOR.
- 2. Both trailers shall have ample headroom; shall be properly lighted, heated and ventilated, and supplied with air conditioning sufficient to properly heat and cool the trailer between 68 and 76 degrees Fahrenheit on any day during construction.
- 3. The trailer for the District Project Manager, and the District IOR shall have a minimum of two separate entrances with an office space for each separated by an interior wall and lockable door, and each space shall be provided with a telephone line, fax line, and high speed internet service, with a new or refurbished office desk at least 30" x 60" in size, with drawers that operate, with a drawer for miscellaneous office supplies, a drawer to accommodate 8 1/2 x 11 size file folders, one drawer to accommodate bulk office supplies, one new or refurbished office chair with casters, one new or refurbished side chairs with casters, a worktable or drawing table in sufficient size to lay out a full size set of project drawings, and one shelf at least 12" deep by 48" in length and secured for safely storing project specifications, project binders, and code books..
- 5. The Contractor shall provide temporary toilet facilities and wash sinks within close proximity (no more than 30 feet) to the trailer for the District Project Manager, and the District IOR, which facilities shall be maintained as recommended by the supplier and common industry standards.
- 3. The trailers, equipment and the furniture shall remain the Contractor's property. Contractor shall remove such property upon completion of the work and the filing of the Certificate of Occupancy by the District.

B. Sanitary Facilities:

- 1. The Contractor shall provide temporary toilet facilities which may consist of portable chemical toilets, and hand washing equipment. Number of toilets shall be based on number of workers with a minimum of 1 toilet facility per 10 workers.

Placement of temporary toilet facilities shall be agreed upon at the site with the District Construction/Project Manager.

2. Toilet facilities shall be kept supplied with toilet paper, and kept in a clean and sanitary condition until completion of the work, and then be removed from the work site. Upon removal, that portion of the site shall be properly cleaned and graded/repaired.

C. Contractor's Security Barricade:

1. The Contractor shall erect the temporary security barricades for the purpose of defining construction lay-down areas, staging area and work zones. Temporary security barricades shall be provided on school site at exterior locations, and at building interiors, as necessary to provide a clear, obvious separation between school users and construction personnel. New or used material may be used.
2. Unless otherwise indicated or specified, barricade shall be constructed of 6'-0" high chain link fence material with T-post condition at bottom for stability, shall have top rails, and 6 gauge minimum wire support at the bottom, BLACK screen material securely attached to the chain link material. Space posts not to exceed 10 feet on centers. Posts shall be of the following nominal pipe dimensions: terminal, corner, and gate posts 2-1/2", line posts 2", with diagonal supports at each corner. Chain link fabric shall be not less than 13 gauge, 2" mesh, and in one width. Posts, fabric and accessories shall be galvanized. Some fencing may require terminal posts to be sunk in the ground, or with appropriately placed concrete footings, and/or may require sandbags for ballast, as determined by the Inspector and/or Project Manager.
3. Chain link fencing shall be free from barbs, icicles or other projections resulting from the galvanizing process, and shall be knuckle-knuckle. Fence fabric having such defects will be rejected even though it has been erected.
4. Gates shall be fabricated of steel pipe with welded corners, and horizontal and diagonal bracing as required to prevent flexing. Fabric to be attached to the frame at 12 inch centers. Provide all gate hardware of a strength and quality to perform satisfactorily until the barricade is removed upon completion of the work. Provide locks sufficient to secure the area, and that can be opened with one hand (e.g. combination locks).
5. At the completion of the work, remove barricade and concrete post footings from the site; backfill and compact fence footing holes by patching with like materials. Existing surface paving that is cut into or removed shall be patched and sealed to match the surrounding areas with like materials, and in the same finishes.
6. Contractor shall maintain all fencing and gates in good order on a daily basis, including the masking of graffiti as deemed necessary by the Inspector, and/or Project Manager, and shall secure the project fencing and gates at the end of every work day.

D. Other Enclosures:

1. Provide temporary weather-tight enclosures at openings in exterior walls to create acceptable working conditions, and/or to allow for temporary heating and for necessary security.
2. Provide protective barriers that shall be at least 4' in height, and extend to protect all areas at tree drip lines, around plants and other improvements designated to remain, as determined by the Inspector and/or Project Manager and related specification sections.

E. Storage Yards and Storage Containers:

1. The Contractor shall fence and maintain storage yards in an orderly manner.
2. Provide steel storage containers, lockable, free from graffiti, and in good condition for materials and equipment that cannot be stored offsite or in a bonded and agreed-upon warehouse.
3. Exact location, size and access of storage yards and steel storage containers shall be approved by the District Construction/Project Manager.
4. Remove storage yards and containers as rapidly as progress of the work will permit.

1.04 REQUIRED SIGNS AT GATES

- A. Contractor shall post at the work site signs not greater than twenty-five feet (25') apart at all gates stating "Authorized Personnel Only – Construction Area" and "No Parking – Fire Lane," as determined by the contract specifications and drawings, and/or as designated by the Inspector and/or Project Manager

1.05 HARD HAT SIGN:

- A. Contractor shall post a sign at each gate and/or entry to any area of construction, identifying the job site as a "hard hat area". No person without a hard hat shall be allowed in the sections of the project under construction. This shall be the responsibility of the Contractor's Project Safety Inspector to enforce.

1.06 DUST AND NOISE CONTROL:

- A. Throughout the entire construction period, Contractor shall maintain dust control by use of water or other environmental controls as may be approved by the Architect, Inspector, and/or Project Manager.
- B. Noise Control: Muffle all equipment to a maximum of 85 Dba at 5' from equipment. Noise control is to be kept to a minimum to perform the operations of construction. NO Radios or projected sound will be allowed on the job site.

1.07 GENERAL ITEMS:

- A. Staging areas for delivery of materials and equipment will be at locations designated by the drawings and specifications, and/or as approved by the Architect, Inspector, and/or Project Manager.
- B. Safety and Security Lighting: Provide 5 foot candles outside.
- C. Noise Control: Muffle all equipment to a maximum of 85 Dba at 5' from equipment.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

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 01564. The measures 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 57 23 - STORM WATER POLLUTION PREVENTION PLAN

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Compliance with local, state, and federal regulations, particularly, with the National Pollutant Discharge Elimination System (NPDES) General Permit For Storm Water Discharges Associated With Construction And Land Disturbance Activities Order No. 2009-0009-DWQ NPDES No. CAS000002 (GP). This includes meeting discharge prohibitions, scheduling, effluent standards, Post Construction Best Management Practices, training, sampling, monitoring, records keeping, receiving water limitations, and annual reporting and certification.
- B. Preparation, implementation, upkeep and monitoring of Storm Water Pollution Prevention Plan (SWPPP) for the purpose of preventing the discharge of pollutants from the Project site into receiving waters. This includes the elimination of pollution discharges such as improper dumping, storm water that has been in contact with pollutants, erosions, spills or leakage from storage tanks or transfer areas.
- C. Payment of application and annual fees required by the State Water Resources Control Board (SWRCB) up until the date of Substantial Completion.
- D. Certification the Project has met all of the conditions of the General Construction Activity Storm Water Permit (GP).
- E. Electronic filing in State Waterboard website smarts.waterboards.ca.gov including risk level calculations, post construction calculations, ad-hoc reporting, annual reporting.

1.2 RELATED REQUIREMENTS

- A. Division 01 – General Requirements.
- B. Section 01 50 00 - - Temporary Facilities and Controls.
- C. Section 01 77 00 - - Closeout Procedures
- D. Section 33 41 00 - - Storm Utility Drainage Piping

1.3 DEFINITIONS

- A. BMP Best Management Practice.
- B. CASQA California Stormwater Quality Association.
- C. DWQ Division of Water Quality.
- D. GP General Construction Activity Storm Water Permit.
- E. LRP Legally Responsible Person.
- F. NOI Notice of Intent.
- G. NOT Notice of Termination.

- H. NPDES National Pollutant Discharge Elimination System.
- I. PRD Permit Registration Document.
- J. QSD Qualified SWPPP Developer.
- K. QSP Qualified SWPPP Practitioner.
- L. LARWQCB Los Angeles Regional Water Quality Control Board.
- M. SWPPP Storm Water Pollution Prevention Plan.
- N. SWRCB State Water Resources Control Board.

1.4 REQUIREMENTS

- A. New or existing Project sites with land disturbance of less than one acre a Permit Registration Document (PRD) is not required, however any BMP indicated in BMP Handbook required to prevent or minimize storm water pollution shall be implemented at no cost to OWNER. CONTRACTOR shall prepare and submit to OAR a SWPPP for review and approval by OWNER.
- B. In addition to the above requirements, on new or existing project sites with land disturbance of one (1) or more acres, submit to OAR a PRD with the appropriate filing fee. Pay annual renewal fees until Substantial Completion of the Work. No progress payment will be made to CONTRACTOR until CONTRACTOR has prepared and obtained OAR approval of the plan in addition to, if required, a properly prepared Notice of Intent with the appropriate filing fee to OWNER.
- C. Contractor’s QSD to prepare and submit to the OAR, within ten days after the date established in the Notice to Proceed, two CDs and four printed copies of the Storm Water Pollution Prevention Plan (SWPPP) as required to comply with storm water pollution regulations for Project site.
- D. Submit, along with PRD, the appropriate application fee made payable to: State Water Resources Control Board.
- E. Prepare SWPPP by following the format in Chapter 2 of the BMP Handbook. The publication is available from www.cabmpandbooks.com and CASQA (casqa.org):

Blue Print Service
 1700 Jefferson Street
 Oakland, CA 94612

Los Angeles County Department of Public Works, Cashier’s
 Office
 900 S. Fremont Avenue
 Alhambra, CA 91803

1.5 SUBMITTALS

- A. Provide documentation in accordance with specific requirements of approved SWPPP.
 - 1. Material quality, grade, type as specified in the Best Management Practice Handbook, BMP, Handbook.
 - 2. Training and qualifications for SWPPP developer (QSD) and practitioner (QSP).
 - 3. Calculations for BMPs requiring design calculations stamped by QSD.
 - 4. Copies of Risk Level Calculations, Post Construction Calculations from Waterboard website prepared by QSD.

5. Electronic Copies of weekly, quarterly, annual reports and test results.
 6. Proof of filing with the Waterboard; copies of PRD and all attachments for the specific project risk level.
- B. Retain the following documents on site until Substantial Completion.
1. Copy of Permit Registration Documents including NOI and supporting documents.
 2. SWPPP and Monitoring Program.
- C. Retain the following documents on site until Substantial Completion. Upon Substantial Completion, CONTRACTOR shall forward all required documentation to OAR. OAR will forward records to District Supervising Civil Engineer for retention period of three years.
1. Inspection Records.
 2. Annual Report Compliance Certification (Due to Waterboard by September 30th and to the district LRP first Monday in August).
 3. Noncompliance Reporting.
 4. Training Records.
 5. Maintenance records for post construction BMPs.
 6. Updated and signed amendment log.

1.6 QUALITY ASSURANCE

- A. Comply with the following as a minimum requirement: California Storm Water Best Management Practice Handbook for Construction Activity (BMP Handbook) Current adopted edition. OAR will forward SWPP to OWNER Supervising Civil Engineer for review and approval.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Provide the quality, grade and type of materials as specified in Best Management Practice, BMP Handbook.
- B. Provide sampling kit from Waterboard Laboratory.

PART 3 – EXECUTION

3.1 IMPLEMENTATION

- A. Install perimeter controls prior to starting Work at the Project site.
- B. Use BMPs from District-approved SWPPP to contain on-site storm water on the Project site. Do not drain on-site water directly into the storm drain. Use the design storm specified in the GP (24-hour 25 year or 24-hour 50 year for Active treatment system).
- C. Designate qualified trained personnel (QSP) and QSD for the proper implementation of the SWPPP. The QSD shall design and the QSP shall implement and inspect BMPs for the design storm and tributary area.
- D. Revise SWPPP to suit changing Project site conditions and also when properly installed systems are ineffective.

- E. Upon Substantial Completion:
 - 1. Maintain and leave storm water pollution prevention controls in place when required for post-construction storm water management and remove those that are not needed as determined by OAR. Handover maintenance log and maintenance plan to OAR. OWNER will maintain prevention controls left in place.
 - 2. Provide Site Monitoring Reports, SWPPP revisions, Compliance Certifications and related documents to OAR. Post-construction storm water operation and the management plan as mentioned in the compliance certifications are considered to be in place at Substantial Completion.
 - 3. File Notice of Termination (NOT) with smarts.waterboard and provide evidence of completion and receipt by the State.

3.2 MONITORING

- A. Conduct examination of pollution prevention controls and provide Site Monitoring Reports per GP and SWPPP, at least weekly, as well as before and after each storm and each day during storm events. Prepare and maintain, at the Project site, a log of each inspection using Site Monitoring Report forms. Notify to LARWQCB within 30 days if there is any noncompliance.
- B. Conduct quarterly non-storm water inspection and complete the attached report.
- C. Conduct sampling and reporting as directed by GP.
- D. CONTRACTOR shall provide proof annually (no later than July 1) that construction activities are in compliance with SWPPP. Non-compliance shall be reported to OAR immediately.

3.3 SPECIAL MONITORING OF RUNOFF

- A. CONTRACTOR is responsible for providing proper storage of tools and materials. If rain or storm water run off comes in contact with pollutants (such as soil stabilizers, paint or fluid from vehicles) report to OAR immediately. CONTRACTOR will be required to sample and remediate contaminated water.

3.4 LIABILITIES AND PENALTIES

- A. Review of the SWPPP and inspection log by OAR shall not relieve CONTRACTOR from liabilities arising from non-compliance of storm water pollution regulations.
- B. Compliance with the Clean Water Act is the sole responsibility of CONTRACTOR. CONTRACTOR shall pay fines issued by Agencies having jurisdiction due to non-compliance to storm water pollution regulations. OWNER shall recover all costs of the fine by appropriate OWNER Assessment.

3.5 CHANGE OF INFORMATION

- A. Submit to OAR completed NOI Form for change of information (Construction Site Information and Material Handling/Management Practices).

3.6 NOTICE OF TERMINATION

- A. Upon Substantial Completion CONTRACTOR shall submit a Notice of Termination (NOT) to OAR.

3.7 ATTACHMENTS

- A. Attachment A - Site Monitoring Report.
- B. Attachment B - Compliance Certification.

- C. Attachment C – Sample Post Construction BMP installation Log and Maintenance Log.
- D. Attachment D – Sample GUSD Construction Storm Water Training Form.
- E. Attachment E – OAR/Contractor Check List.
- F. Attachment F – Quarterly Non-Storm Water Form.

END OF SECTION

OWNER Project Number

Glendale Unified School District
As OWNER ATTACHMENT
"A"
STORM WATER POLLUTION PREVENTION
SITE MONITORING REPORT

STATE OF CALIFORNIA
STATE WATER
RESOURCES CONTROL
BOARD

School Name: _____
Project Description: _____ Contract Number _____

I. Type of Examination: (Use one form for each type of examination):

- Prior to Anticipated Storm Event After Actual Storm Event Weekly

Date Examined: _____

II. Check the response for each SWPPP question below:

	YES	NO
1. Do you have an approved Storm Water Pollution Prevention Plan (SWPPP) and a BMP Handbook on the Project site?	<input type="checkbox"/>	<input type="checkbox"/>
2. Does your SWPPP incorporate an up-to-date erosion control plan?	<input type="checkbox"/>	<input type="checkbox"/>
3. Is the erosion control installed per plan?	<input type="checkbox"/>	<input type="checkbox"/>
4. Is the Work at a stage where the erosion control plan can not be constructed, is the erosion control at the Maximum Extent Practicable for the stage you are in?	<input type="checkbox"/>	<input type="checkbox"/>
5. Did you observe the presence of any floating materials such as oil, grease, pieces of wood, paper, etc., odor, toxics, and/ or sediments?	<input type="checkbox"/>	<input type="checkbox"/>
6. If yes, what is it that you observed? _____		

III. Check the status of the following items as observed:

SWPPP Items	Acceptable	Not Acceptable	Repairs Required	Date Repairs Completed
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
2. Water Quality Basin	--	--		_____
3. Silt Fences	--	--		_____
4. Hay bales/ Check dams/ Sandbags	--	--		_____
5. Berms and Dikes	--	--		_____
6. Sand/Gravel Inlet	--	--		_____
7. Slope Protection - Polymer and Mulch	--	--		_____
8. Vegetation / Re-vegetation	--	--		_____
9. Dust Control	--	--		_____
10. Surface Erosion	--	--		_____
11. Slope Instability	--	--		_____
12. Storage	--	--		_____
13. Disposal	--	--		_____
14. Spills	--	--		_____
15. Clean-up	--	--		_____
16. _____	--	--		_____
17. _____	--	--		_____

Detailed Storm Water Quality Construction Site Inspection Checklist
ATTACHMENT "A" (Cont.)

GENERAL INFORMATION				
Project Name				
Project Number	GUSD Ref. No.			
Contractor				
Inspector's Name				
Inspector's Title				
Signature				
Date of Inspection				
Inspection Type (Check Applicable)	<input type="checkbox"/> Prior to forecast rain		<input type="checkbox"/> After a rain event	
	<input type="checkbox"/> 24-hr intervals during extended rain		<input type="checkbox"/> Other _____ Weekly or Quarterly _____	
Season (Check Applicable)	<input type="checkbox"/> Rainy		<input type="checkbox"/> Non-Rainy	
Storm Data	Storm Start Date & Time:		Storm Duration (hrs):	
	Time elapsed since last storm (Circle Applicable Units)	Min. Hr. Days	Approximate Rainfall Amount (inches)	

PROJECT AREA SUMMARY AND DISTURBED SOIL AREA (DSA) SIZE	
Total Project Area	_____ Acres
Field Estimate of Active DSAs	_____ Acres
Field Estimate of Non-Active DSAs	_____ Acres

INSPECTION OF BMPs - ATTACHMENT "A" (Cont.)				
BMP	Yes	No	N/A	Corrective Action
Preservation of Existing Vegetation				
Is temporary fencing provided to preserve vegetation in areas where no construction activity is planned?				
Location:				
Location:				
Location:				
Location:				
Erosion Control				
Does the applied temporary erosion control provide 100% coverage for the affected areas?				
Are any non-vegetated areas that may require temporary erosion control?				
Is the area where erosion controls are used required free from visible erosion?				
Location:				
Location:				
Location:				
Location:				
Temporary Linear Sediment Barriers (Silt Fence, Fiber Rolls, Sandbag Barriers, etc.)				
Are temporary linear sediment barriers properly installed, functional and maintained?				
Are temporary linear sediment barriers free of accumulated litter?				
Is the built-up sediment less than 1/3 the height of the barrier?				
Are cross barriers installed where necessary and properly spaced?				
Location:				
Location:				
Location:				
Location:				
Location:				
Storm Drain Inlet Protection				
Are storm drain inlets internal to the project properly protected?				
Are storm drain inlet protection devices in working order and being properly maintained?				
Location:				
Location:				
Location:				
Location:				
Location:				

INSPECTION OF BMPs - ATTACHMENT "A" (Cont.)				
BMP	Yes	No	N/A	Corrective Action
Sediment Basins				
Are basins designed in accordance with the requirements of the General Permit?				
Are basins maintained to provide the required retention/detention?				
Are basin controls (inlets, outlets, diversions, weirs, spillways, and racks) in working order?				
Location:				
Location:				
Location:				
Location:				
Stockpiles				
Are all locations of temporary stockpiles, including soil, hazardous waste, and construction materials in approved areas?				
Are stockpiles protected from run-on, run-off from adjacent areas and from winds?				
Are stockpiles located at least 15 m from concentrated flows, downstream drainage courses and storm drain inlets?				
Are required covers and/or perimeter controls in place?				
Location:				
Location:				
Location:				
Location:				
Concentrated Flows				
Are concentrated flow paths free of visible erosion?				
Location:				
Location:				
Location:				
Location:				
Tracking Control				
Is the entrance stabilized to prevent tracking				
Is the stabilized entrance inspected daily to ensure that it is working properly				
Are points of ingress/egress to public/private roads inspected and swept and vacuumed as needed?				
Are all paved areas free of visible sediment tracking or other particulate matter?				
Location:				
Location:				
Location:				
Location:				

INSPECTION OF BMPs - ATTACHMENT "A" (Cont.)				
BMP	Yes	No	N/A	Corrective Action
Wind Erosion Control				
Is dust control implemented?				
Location:				
Location:				
Location:				
Location:				
Dewatering Operations				
Are all one-time dewatering operations covered by the General Permit inspected before and as they occur and BMPs implemented as necessary during discharge?				
Is ground water dewatering handled in conformance with the dewatering permit issued by the LARWQCB?				
Is required treatment provided for dewatering effluent?				
Location:				
Location:				
Location:				
Location:				
Vehicle & Equipment Fueling, Cleaning, and Maintenance				
Are vehicle and equipment fueling, cleaning and maintenance areas reasonably clean and free of spills, leaks, or any other deleterious material?				
Are vehicle and equipment fueling, cleaning and maintenance activities performed on an impermeable surface in dedicated areas?				
If no, are drip pans used?				
Are dedicated fueling, cleaning, and maintenance areas located at least 15 m away from downstream drainage facilities and watercourses and protected from run-on and runoff?				
Is wash water contained for infiltration/ evaporation and disposed of appropriately?				
Is on-site cleaning limited to washing with water (no soap, soaps substitutes, solvents, or steam)?				
On each day of use, are vehicles and equipment inspected for leaks and if necessary, repaired?				
Location:				
Location:				
Location:				
Location:				
Waste Management & Materials Pollution Control				
Are material storage areas and washout areas protected from run-on and runoff, and located at least 15 m from concentrated flows and downstream drainage facilities?				

INSPECTION OF BMPs - ATTACHMENT "A" (Cont.)

BMP	Yes	No	N/A	Corrective Action
Are all material handling and storage areas clean; organized; free of spills, leaks, or any other deleterious material; and stocked with appropriate clean-up supplies?				
Are liquid materials, hazardous materials, and hazardous wastes stored in temporary containment facilities?				
Are bagged and boxed materials stored on pallets?				
Are hazardous materials and wastes stored in appropriate, labeled containers?				
Are proper storage, clean-up, and spill-reporting procedures for hazardous materials and wastes posted in open, conspicuous and accessible locations adjacent to storage areas?				
Are temporary containment facilities free of spills and rainwater?				
Are temporary containment facilities and bagged/boxed materials covered?				
Are temporary concrete washout facilities designated and being used?				
Are temporary concrete washout facilities functional for receiving and containing concrete waste and are concrete residues prevented from entering the drainage system?				
Do temporary concrete washout facilities provide sufficient volume and freeboard for planned concrete operations?				
Are concrete wastes, including residues from cutting and grinding, contained and disposed of off-site or in concrete washout facilities?				
Are spills from mobile equipment fueling and maintenance properly contained and cleaned up?				
Is the site free of litter?				
Are trash receptacles provided in the yard, field trailer areas, and at locations where workers congregate for lunch and break periods?				
Is litter from work areas collected and placed in watertight dumpsters?				
Are waste management receptacles free of leaks?				
Are the contents of waste management receptacles properly protected from contact with storm water or from being dislodged by winds?				
Are waste management receptacles filled at or beyond capacity?				
Location:				
Location:				
Location:				
Location:				
Temporary Water Body Crossing or Encroachment				
Are temporary water body crossings and encroachments constructed appropriately?				
Does the project conform to the requirements of the 404 permit and/or 1601 agreement?				
Location:				

INSPECTION OF BMPs - ATTACHMENT "A" (Cont.)				
BMP	Yes	No	N/A	Corrective Action
Location:				
Location:				
Location:				
Illicit Connection/ Discharge				
Is there any evidence of illicit discharges or illegal dumping on the project site?				
If yes, has the Owner/Operator been notified?				
Location:				
Location:				
Location:				
Location:				
Discharge Points				
Are discharge points and discharge flows free from visible pollutants?				
Are discharge points free of any significant sediment transport?				
Location:				
Location:				
Location:				
Location:				
SWPPP Update				
Does the SWPPP and Project Schedule adequately reflect the current site conditions and contractor operations?				
Are all BMPs shown on the Erosion Control Plans installed in the proper location(s) and according to the details in the SWPPP?				
Location:				
Location:				
Location:				
Location:				
General				
Are there any other potential concerns at the site?				
Location:				
Location:				
Location:				
Location:				
Storm Water Monitoring				
Does storm water discharge directly to a water body listed in the General Permit as impaired for sediment/sedimentation or turbidity?				

INSPECTION OF BMPs - ATTACHMENT "A" (Cont.)				
BMP	Yes	No	N/A	Corrective Action
If yes, were samples for sediment/sedimentation or turbidity collected pursuant to the sampling and analysis plan in the SWPPP?				
Did the sampling results indicate that the discharges are causing or contributing to further impairment?				
If yes, were the erosion/sediment control BMPs improved or maintained to reduce the discharge of sediment to the water body?				
Were there any BMPs not properly implemented or breaches, malfunctions, leakages or spills observed which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water?				
If yes, were samples for non-visually detectable pollutants collected pursuant to the sampling and analysis plan during rain events?				
If sampling indicated pollution of the storm water, were the leaks, breaches, spills, etc. cleaned up and the contaminated soil properly disposed of?				
Were the BMPs maintained or replaced?				
Were soil amendments (e.g., gypsum, lime) used on the project?				
If yes, were samples for non-visually detectable pollutants collected pursuant to the sampling and analysis plan in the SWPPP?				
If sampling indicated pollution of the storm water by the use of the soil amendments, is there a contingency plan for retention onsite of the polluted storm water?				
Did storm water contact stored materials or waste and run off the construction site? (Materials not in watertight containers, etc.)				
If yes, were samples for non-visually detectable pollutants collected pursuant to the sampling and analysis plan in the SWPPP?				

IV. Describe any problems or required repairs checked above and the necessary actions needed:

Item	Description of Problem or Required Repair	Action Needed
_____	_____	_____
_____	_____	_____
_____	_____	_____

Examination Performed by
CONTRACTOR:

_____ By (Print Name, Title and Sign) _____ Date

Verified by Inspector:

_____ Print Name, Title and Sign _____ Date

OWNER Project Number

**Glendale Unified School District
As OWNER ATTACHMENT
"B"
GENERAL CONSTRUCTION ACTIVITY
STORM WATER PERMIT
COMPLIANCE CERTIFICATION**

STATE OF CALIFORNIA
STATE WATER BOARD
WDID NO. _____

School Name: _____
Project Description: _____ Contract Number _____

ANNUAL CERTIFICATION

I certify the Project has met the following conditions: All elements of the Storm Water Pollution Prevention Plan are in place; construction materials and equipment maintenance waste have been disposed of properly; and the Project site is in compliance with all local storm water management requirements including erosion/sediment control requirements, and the appropriate use permits have been obtained. The reports have been uploaded to smarts.waterboards.ca.gov system.

CONTRACTOR:

Print Name: _____ Title: _____

Signature: _____ Date: _____

SUBSTANTIAL COMPLETION CERTIFICATION

I certify the Project has been completed and the following conditions have been met: All elements of the Storm Water Pollution Prevention Plan have been completed; construction materials and equipment maintenance waste have been disposed of properly; the Project site is in compliance with all local storm water management requirements including erosion/sediment control requirements and the appropriate use permits have been obtained; and a post-construction storm water operation, and management plan is in place.

CONTRACTOR:

Print Name: _____ Title: _____

Signature: _____ Date: _____

REPORT DATE

ATTACHMENT "C"
**POST CONSTRUCTION BMP INSTALLATION LOG
AND MAINTENANCE LOG**

Quarterly Certification Letter

ATTACH SITE PLAN WITH BMPS HIGHLIGHTED

BMP	INSTALLATION INSTRUCTIONS LOCATION	MAINTENANCE DATE	NEXT SCHED DATE
1			
2			
3			
4			
5			
6			
OAR NAME SIGNATURE DATE		CONTRACTOR NAME SIGNATURE DATE	

ATTACHMENT "D"
 GUSD CONSTRUCTION STORM WATER TRAINING FORM
 01 7416 ATTACHMENT C JUNE 2010

MEETING DATE	PROJECT	PROJECT NUMBER
--------------	---------	----------------

ATTENDANCE-SIGNATURE (Add additional sheets if required)		

STORM WATER TOPICS DISCUSSED

SUGGESTIONS / COMMENTS

OAR COMMENTS

OAR SIGNATURE	DATE	CONTRACTOR	DATE
---------------	------	------------	------

SUGGESTED TOPICS FOR DISCUSSION

<input type="checkbox"/> PREPARING FOR A STORM EVENT	<input type="checkbox"/> GOOD HOUSEKEEPING	<input type="checkbox"/> MAINTENANCE POST BMPS
<input type="checkbox"/> MAINTAINING STOCKPILES	<input type="checkbox"/> SOURCE CONTROL	<input type="checkbox"/> CASQA MANUAL
<input type="checkbox"/> DUST CONTROL	<input type="checkbox"/> OAR ROLE & RESPONSIBILITY	<input type="checkbox"/> SWPPP UPDATING
<input type="checkbox"/> TRAINING NEW STAFF	<input type="checkbox"/> CONTRACTOR ROLE	<input type="checkbox"/> SCHEDULING
<input type="checkbox"/> RECORD KEEPING	<input type="checkbox"/> FREQUENTLY ASKED QUESTIONS	<input type="checkbox"/> PREVENTING FLOODING

REPORT DATE

ATTACHMENT "E"

OAR / CONTRACTOR CHECK LIST

Quarterly Certification Letter

SITE _____

PROJECT NUMBER _____

IS SWPPP BOOK ONSITE AND UPDATED	<input type="checkbox"/> YES	<input type="checkbox"/> NO
TRAINING RECORDS	<input type="checkbox"/> YES	<input type="checkbox"/> NO
CONSTRUCTION SCHEDULE	<input type="checkbox"/> YES	<input type="checkbox"/> NO
EROSION CONTROL PLAN	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Property Line Dileanated	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Active / Inactive Areas	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Drainage Patterns	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Discharge Points	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Sampling Points	<input type="checkbox"/> YES	<input type="checkbox"/> NO
BMPs with legend	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Staging Areas, Stockpiles, entrance exit	<input type="checkbox"/> YES	<input type="checkbox"/> NO
Vehicle Storage, concrete wahsout	<input type="checkbox"/> YES	<input type="checkbox"/> NO
SIGNED COPY OF NOI ON WALL	<input type="checkbox"/> YES	<input type="checkbox"/> NO
WEEKLY REPORTS FILED	<input type="checkbox"/> YES	<input type="checkbox"/> NO

LATEST DATED: _____

SWPPP AMENDMENTS DOCUMENTED _____

ANNUAL FEES PAID AND REPORTS FILED _____ LATEST DATED: _____

Data Submitter	_____
login	_____
OAR	_____
login	_____

DATE OF LAST OEHS INSPECTION VISIT _____ LATEST DATED: _____

WERE OEHS RECOMMENDATION IMPLEMENTED YES NO

CERTIFICATION OF CONTRACTORS QSP

Name	_____
Agency	_____
Number	_____
Expiration Date	_____
Email	_____
Phone	_____

Sampling Kit _____ Lab Name _____

COMMENTS _____

OAR NAME	CONTRACTOR NAME
SIGNATURE	SIGNATURE
DATE	DATE

Glendale Unified School District

Attachment "F"
Quarterly / Annual Non-Stormwater Form

I. WDID NO. _____

II. FACILITY OPERATOR INFORMATION

Facility Name _____ Contact Person _____

Mailing Address _____ Title _____

City _____ State CA Zip _____ Phone _____

III. FACILITY SITE INFORMATION

Facility Name _____ Contact Person _____

Location _____ Title _____

City _____ State CA Zip _____ Phone _____

IV. PERMIT LANGUAGE

All dischargers are required to conduct quarterly, non-storm water visual inspections. For these inspections, the discharger must visually observe each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.

CGP Section II.E describes authorized non-storm water discharges including those from de-chlorinated potable water sources such as: fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, uncontaminated ground water dewatering, and other discharges not subject to a separate general NPDES permit adopted by a region. Additionally, authorized non-storm water discharges must not be used to clean up failed or inadequate construction or post-construction BMPs designed to keep materials onsite. Authorized non-storm water dewatering discharges may require a permit because some Regional Water Boards have adopted General Permits for dewatering discharges. The General Permit prohibits the discharge of storm water that causes or threatens to cause pollution, contamination, or nuisance.

Non-storm water discharges directly connected to receiving waters or the storm drain system have the potential to negatively impact water quality. The discharger must implement measures to control all non-storm water discharges during construction, and from dewatering activities associated with construction. Examples include; properly washing vehicles in contained areas, cleaning streets, and minimizing irrigation runoff.

Non-storm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Non-storm water discharges may non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

V. DOCUMENT CHECKLIST (Please check each item to verify that the documents are attached)

Did Authorized Discharge take place

Did Unauthorized Discharge take place

Form 2 Attached

Form 3 Attached

Attachment "F" (Cont.)

<u>Structural Best Management Practices Housekeeping for Non-Visible Pollutants</u>	<u>BMP Conditions E, NM, N/A YES OR NO</u>	<u>Actions Taken or BMPs Added</u>
Drainage Areas		
Free of Floating & Suspended Material		
Free of Sheen/Discoloration		
Free of Turbidity		
Free of Odor		
Construction Materials Storage Areas		
Materials Properly Stored		
Pollutants Covered		
Pollutants Bermed		
Construction Waste Management		
Containment Stockpiled Waste		
Containment Sanitary Facilities		
Containment Waste Watertight Containers		
Vehicle Storage/Fueling/Spill Prevention		
Fueling Procedures/Designated Areas		
Vehicle Storage with Containment		
Spill Kit Onsite		
Concrete Residuals & Washouts Wastes		
Properly Placed Washout		
Secondary Containment		
Landscape Materials		
Stored Away from Flow Lines		
Containment Fertilizers/Soil Amendments		
Secondary Containment Plants		
Observations/Comments:		
E-EFFECTIVE N/M-NEEDS MAINTENANCE N/A-NOT APPLICABLE YES or NO		

Attachment "F" (Cont.)

REPORT – PART A FORM 2 QUARTERLY VISUAL OBSERVATIONS OF AUTHORIZED NON STORM WATER DISCHARGES (NSWDs)

- Quarterly dry weather visual observations are required of each authorized NSWD.
- Observe each authorized NSWD source, impacted drainage area, and discharge location.
- Authorized NSWDs must meet the conditions provided in Section D (pages 5-6), of the General Permit.
- Make additional copies of this form as necessary.

QUARTER: JULY-SEPT. DATE: _____	Observers Name: _ Title: Signature:	WERE ANY AUTHORIZED NSWDs DISCHARGED DURING THIS QUARTER? YES <input type="checkbox"/> If YES, complete Part B of this form. NO <input type="checkbox"/>
QUARTER: OCT.-DEC. DATE: _____	Observers Name: _ Title: Signature:	WERE ANY AUTHORIZED NSWDs DISCHARGED DURING THIS QUARTER? YES <input type="checkbox"/> If YES, complete Part B of this form. NO <input type="checkbox"/>
QUARTER: JAN.-MARCH DATE: _____	Observers Name: _ Title: Signature:	WERE ANY AUTHORIZED NSWDs DISCHARGED DURING THIS QUARTER? YES <input type="checkbox"/> If YES, complete Part B of this form. NO <input type="checkbox"/>
QUARTER: APRIL-JUNE DATE: _____	Observers Name: _ Title: Signature:	WERE ANY AUTHORIZED NSWDs DISCHARGED DURING THIS QUARTER? NO YES <input type="checkbox"/> If YES, complete Part B of this form. NO <input type="checkbox"/>

REPORT
FORM 2 – QUARTERLY VISUAL OBSERVATIONS OR AUTHORIZED
NON-STORM WATER DISCHARGES (NSWDs)

DATE/TIME OF OBSERVATION	SOURCE AND LOCATION OF AUTHORIZED NSWD <u>Example:</u> Air conditioner Units on Building C	NAME OF AUTHORIZED NSWD <u>Example:</u> Air conditioner condensate	DESCRIBE AUTHORIZED NSWD CHARACTERISTICS Indicate weather authorized NSWD is clear, cloudy, or discolored, causing staining, contains floating objects or an oil sheen, has odors, etc.		DESCRIBE ANY REVISED OR NEW BMP's AND PROVIDE THEIR IMPLEMENTATION DATE
			At the NSWD Source	At the NSWD Drainage Area and Discharge Location	
_____ _____ AM <input type="checkbox"/> PM <input type="checkbox"/>					
_____ _____ AM <input type="checkbox"/> PM <input type="checkbox"/>					
_____ _____ AM <input type="checkbox"/> PM <input type="checkbox"/>					
_____ _____ AM <input type="checkbox"/> PM <input type="checkbox"/>					
_____ _____ AM <input type="checkbox"/> PM <input type="checkbox"/>					

REPORT – PART A FORM 3 QUARTERLY VISUAL OBSERVATIONS OF UNAUTHORIZED NON STORM WATER DISCHARGES (NSWDs)

- Unauthorized NSWDs are discharges (such as wash or rinse waters) that do not meet the conditions provided in Section D (pages 5-6) of the General Permit.
- Quarterly visual observations are required to observe current and detect prior unauthorized NSWD.
- Quarterly visual observations are required during dry weather and at all facility drainage areas.
- Each unauthorized NSWD source, impacted drainage area, and discharge location must be identified and observed.
- Unauthorized NSWDs that can not be eliminated within 90 days of observation must be reported to the Regional Board in accordance with Section A.10.e of the General Permit.
- Make additional copies of this form as necessary.

<p>QUARTER: JULY-SEPT. DATE/TIME OF OBSERVATIONS _____ <input type="checkbox"/> AM _____ <input type="checkbox"/> PM</p>	<p>Observers Name: _ Title: Signature:</p>	<p>WERE ANY AUTHORIZED NSWDs OBSERVED? YES <input type="checkbox"/> NO <input type="checkbox"/> WERE THERE INDICATIONS OF PRIOR UNAUTHORIZED NAWDS? YES <input type="checkbox"/> NO <input type="checkbox"/> If YES, complete Part B of this form.</p>
<p>QUARTER: OCT.-DEC. DATE/TIME OF OBSERVATIONS _____ <input type="checkbox"/> AM _____ <input type="checkbox"/> PM</p>	<p>Observers Name: _ Title: Signature:</p>	<p>WERE ANY AUTHORIZED NSWDs OBSERVED? YES <input type="checkbox"/> NO <input type="checkbox"/> WERE THERE INDICATIONS OF PRIOR UNAUTHORIZED NAWDS? YES <input type="checkbox"/> NO <input type="checkbox"/> If YES, complete Part B of this form.</p>
<p>QUARTER: JAN.-MARCH DATE/TIME OF OBSERVATIONS _____ <input type="checkbox"/> AM _____ <input type="checkbox"/> PM</p>	<p>Observers Name: _ Title: Signature:</p>	<p>WERE ANY AUTHORIZED NSWDs OBSERVED? YES <input type="checkbox"/> NO <input type="checkbox"/> WERE THERE INDICATIONS OF PRIOR UNAUTHORIZED NAWDS? YES <input type="checkbox"/> NO <input type="checkbox"/> If YES, complete Part B of this form.</p>
<p>QUARTER: APRIL-JUNE DATE/TIME OF OBSERVATIONS _____ <input type="checkbox"/> AM _____ <input type="checkbox"/> PM _</p>	<p>Observers Name: _ Title: Signature:</p>	<p>WERE ANY AUTHORIZED NSWDs OBSERVED? YES <input type="checkbox"/> NO <input type="checkbox"/> WERE THERE INDICATIONS OF PRIOR UNAUTHORIZED NAWDS? YES <input type="checkbox"/> NO <input type="checkbox"/> If YES, complete Part B of this form.</p>

REPORT
FORM 3 – QUARTERLY VISUAL OBSERVATIONS OR UNAUTHORIZED
NON-STORM WATER DISCHARGES (NSWDs)

OBSERVATION DATE (FROM REVERSE SIDE)	NAME OF UNAUTHORIZED NSWD <i>Example:</i> Vehicle Wash Water	SOURCE AND LOCATION OF AUTHORIZED NSWD <i>Example:</i> NW Corner of Parking Lot	DESCRIBE UNAUTHORIZED NSWD CHARACTERISTICS Indicate weather unauthorized NSWD is clear, cloudy, or discolored, causing stains, contains floating objects or an oil sheen, has odors, etc.		DESCRIBE CORRECTIVE ACTIONS TO ELIMINATE UNAUTHORIZED NSWD AND TO CLEAN IMPACTED DRAINAGE AREAS. PROVIDE UNAUTHORIZED NSWD ELIMINATION DATE
			AT THE UNAUTHORIZED NSWD SOURCE	AT THE UNAUTHORIZED NSWD DRAINAGE AREA AND DISCHARGE LOCATION	
_____ <input type="checkbox"/> AM <input type="checkbox"/> PM					
_____ <input type="checkbox"/> AM <input type="checkbox"/> PM					
_____ <input type="checkbox"/> AM <input type="checkbox"/> PM					
_____ <input type="checkbox"/> AM <input type="checkbox"/> PM					
_____ <input type="checkbox"/> AM <input type="checkbox"/> PM					

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 SUBMITTALS

- 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 72 00

FIELD ENGINEERING

PART 1-GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Surveying and Field Engineering Services.

1.02 QUALITY CONTROL

- A. Land Surveyor: Registered in the State of California and acceptable to the District's Architect, Inspector, and/or Project Manager.

1.03 LINES AND GRADES

- A. The Contractor shall provide all construction survey work required for the accurate location of the work. Horizontal and vertical control for the work shall be from the project reference marks as shown on the Drawings. In all questions arising as to the proper location of the work, the District's A&E team's, and the Inspector's decision shall be final.
- B. The Contractor shall verify final configuration of the project during demolition work. Minor adjustments of the work to accommodate existing field conditions shall be the responsibility of the Contractor.
- C. Replace, at no increase in Contract Sum, control points which may be lost or destroyed; base requirements on original survey control.

PART 2- PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify locations of survey control points prior to starting work. Promptly notify District Architect and Inspector of any discrepancies discovered.

3.2 SURVEY REFERENCE POINTS

- A. Protect survey control points prior to starting site work; preserve permanent reference points during construction. Make no changes without prior written notice to the Architect and Inspector.
- B. Promptly report to the Architect and the Inspector the loss or destruction of any reference point or relocation required because of changes in grades or other reasons. Replace dislocated survey points based on original survey control.

3.3 SURVEY REQUIREMENTS

- A. Establish a minimum of three (3) permanent bench marks on site, referenced to establish control points. Record locations, with horizontal and vertical data, on Project Record Documents.
- B. Establish 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; and utility locations, slopes and invert elevations.
 2. Grid or axis for structures.
 3. Building foundation, column locations, and ground floor elevations.
 4. Controlling lines and levels required for mechanical and electrical work.
 5. Verify layouts as Work proceeds to assure compliance with required lines, levels and tolerances.
- C. Periodically certify layouts by same means, with same approvals by the Architect and Inspector.

3.4 RECORDS

- A. Maintain a complete and accurate log of all control and survey Work as it progresses.
- B. On completion of foundation walls and major site improvement, including underground utilities, prepare a certified survey showing all dimensions, locations, angles, and elevations of construction to the Architect and Inspector for review and approval of the final survey for the Project record.

END OF SECTION

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. This Section specifies administrative and procedural requirements for cutting and patching.

1.02 RELATED SECTIONS

- A. Section 013113: Project Coordination
- B. Section 013119: Project Meetings
- C. Section 013300: Submittals
- D. Section 013216: Schedule and Reports
- E. Section 014500: Testing and Laboratory Services
- F. Section 017836: Warranties & Bonds

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 SUBMITTALS

- A. The word "cutting" as used in the Contract Documents includes, but is not limited to, cutting, drilling, chopping, and other similar operations and the word "patching" includes, but is not limited to, patching, rebuilding, reinforcing, repairing, refurbishing, restoring, replacing, or other similar operations.
- B. Cutting and Patching Proposal: CONTRACTOR shall submit a proposal describing procedures well in advance of the time cutting and patching will be performed if the Contract Documents requires approval of these procedures before proceeding. The Contractor shall be responsible for locating existing utilities within the Limits of Work, whether shown or not, prior to any excavation. Contractor shall protect in place all utilities not identified to be removed, relocated or abandoned. Include the following information, as applicable, in the proposal:
 - 1. Describe the extent of cutting and patching required. Denote how it will be performed and indicate why it cannot be avoided.
 - 2. Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in the building's appearance or other significant visual elements.

3. List products to be used and firms or entities that will perform this Work.
4. Indicate dates when cutting and patching will be performed.
5. Utilities: List utilities that cutting and patching operations will disturb or affect. List utilities to be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
6. Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.
7. Review by ARCHITECT/Engineer and DSA INSPECTOR prior to proceeding with cutting and patching does not waive ARCHITECT/Engineer right to later require complete removal and replacement of defective Work.

3.02 QUALITY ASSURANCE

A. Requirements for structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.

1. Obtain approval from ARCHITECT/Engineer and DSA Inspector of the cutting and patching proposal before cutting and patching the following structural elements:
 - a. Foundation construction
 - b. Bearing and retaining walls
 - c. Structural concrete
 - d. Structural steel
 - e. Lintels
 - f. Timber and primary wood framing
 - g. Miscellaneous structural metals
 - h. Equipment supports
 - i. Piping, ductwork, vessels, and equipment
 - j. Structural systems of special construction in Division 13 Sections.

B. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.

1. Obtain review of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
 - a. Primary operational systems and equipment
 - b. Air or smoke barriers

- c. Water, moisture, or vapor barriers
 - d. Membranes and flashings
 - e. Fire protection systems
 - f. Noise and vibration control elements and systems
 - g. Control systems
 - h. Communication and/or data systems
 - i. Electrical wiring systems
 - j. Operating systems of special construction in Division 13 Sections
- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the opinion of ARCHITECT/Engineer/District, or DSA Inspector reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually satisfactory manner.
- 1. If possible, retain the original installer or fabricator to cut and patch the exposed Work listed below. If it is impossible to engage the original installer or fabricator, engage another recognized experienced and specialized firm.
 - a. Firestopping
 - b. Acoustical ceilings
 - c. Acoustical panels
 - d. Carpeting
 - e. HVAC enclosures, cabinets, or covers
 - f. Ceramic and quarry tile
 - g. Gypsum board
 - h. Masonry (exterior and interior where exposed)
 - i. Tack boards
 - j. Casework
 - k. Finish carpentry

3.03 WARRANTY

- A. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required or existing.

3.04 INSPECTION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.
 - 1. Before proceeding, meet at the Project site with District Inspector, District Project Manager and District Maintenance Supervisors and all contractors involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding. ENSURE THAT ALL AVAILABLE AS-BUILT DRAWINGS ARE PULLED AND REVIEWED PRIOR TO ANY CUTTING.

3.05 PREPARATION

- A. Temporary support: Provide adequate temporary support of existing improvements or Work to be cut, with prior approval by the Structural Engineer and/or DSA Inspector.
- B. Protection: Protect existing improvements and Work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of existing improvements or Work that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Where the Work requires sandblasting of existing surfaces in order to receive new materials secured by cementitious, adhesive or chemical bond, completely remove existing finishes, stains, oil, grease, bitumen, mastic and adhesives or other substances deleterious to the new bonding and/or fastening of new Work. Utilize wet sand blasting for interior surfaces and for exterior surfaces where necessary to prevent objectionable production of dust.

3.06 PERFORMANCE

- A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay. Carefully remove existing Work to be salvaged and/or reinstalled. Protect and store for reuse into the Work. Verify compatibility and suitability of existing substrates before starting the Work.
- B. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining Work. Where possible, review proposed procedures with the original installer; comply with the original installer's recommendations.
 - 1. In general, where cutting, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Cut through concrete and masonry using a cutting machine, such as a carborundum saw or a diamond-core drill. Saw cut reinforcing bars and paint ends with bituminous paint except where bonded into new concrete or masonry.
 - 4. Comply with requirements of applicable Division 2 Sections where cutting and patching requires excavating, backfill, and/or recompaction.

5. Woodwork: Cut and or remove to a panel or joint line.
 6. Sheet Metal: Remove back to joint, lap, or connection. Secure loose or unfastened ends or edges and seal watertight.
 7. Glass: Remove cracked, broken, or damaged glass and clean rebates and stops of setting materials.
 8. Plaster: Cut back to sound plaster on straight lines, and back bevel edges of remaining plaster. Trim existing lath and prepare for new lath.
 9. Gypsum Wallboard: Cut back on straight lines to undamaged surfaces with at least two opposite cut edges centered on supports.
 10. Acoustical ceilings: Remove hanger wires and related appurtenances where ceilings are not scheduled to be installed.
 11. Tile: Cut back to sound tile and backing on joint lines.
 12. Flooring: Completely remove flooring and clean backing of prior adhesive. Carefully remove wood flooring for patching and repairing of existing wood flooring scheduled to remain.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with required tolerances.
1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation. Verify conditions of existing substrates prior to executing Work.
 2. Restore exposed finishes of patched areas and extend finish restoration into retaining adjoining construction in a manner that will eliminate all evidence of patching and refinishing.
 3. Concrete: Maintain cut edges in a moist condition for twenty four (24) hours prior to the placement of new concrete. In lieu of this an epoxy adhesive may be provided. Finish placed concrete to match existing unless noted otherwise. Concrete shall have a minimum compressive strength of 3,000 psi where installed to repair and/or match existing improvements, unless noted otherwise, and approved by the Structural Engineer, in conjunction with review by the DSA Inspector.
 4. Metal Fabrications: Items to remain exposed shall have their edges cut and ground smooth and rounded.
 5. Sheet Metal: Replace removed or damaged sheet metal items as required for new Work.
 6. Glass: Install matching glass and re-seal exterior window assemblies.
 7. Lath and Plaster: Install new lath materials to match existing and fasten to supports at 6" centers. Provide a 6" lap where new lath to adjoins existing lath. Fasten new lath as required for new Work. Restore paper backings as required. Apply a bonding agent on cut edges of existing plaster. Apply three coat plaster of the type, thickness, finish, texture, and color to match existing.
 8. Gypsum Wallboard: Fasten cut edges of wallboard. Install patches with at least two opposite edges centered on supports and secure at 6" centers. Tape and

finish joints and fastener heads. Patching shall be non-apparent when painted or finished.

9. Acoustical Ceilings: Comply with the requirements for new Work specified in related sections of the Contract Documents.
10. Resilient Flooring: Completely remove flooring and prepare substrate for new material.
11. Painting: Prepare areas to be patched, patch and paint as specified under related sections of the Contract Documents.

3.06 CLEANING

- A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged coverings to their original condition.

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.
- 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 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 09650.
 - 3. Wood Flooring: Remove defects and blemishes by sanding surface and painting according to Section 09900.
 - 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 were 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.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

- A. Glendale Unified School District requires that this project generate the least amount of trash and waste possible.
 - 1. Recycle Goal: Recycle 75% of construction and demolition debris (by weight).
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
 - 1. Aluminum and plastic beverage containers.
 - 2. Corrugated cardboard.
 - 3. Wood pallets.
 - 4. Clean dimensional wood: May be used as blocking or furring.
 - 5. Concrete.
 - 6. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
 - 7. Glass.
 - 8. Gypsum drywall and plaster.
 - 9. Plastic buckets.
 - 10. Carpet, carpet cushion, carpet tile, and carpet remnants: DuPont (<http://flooring.dupont.com>) and Interface (www.interfaceinc.com) conduct reclamation programs.
 - 11. Paint.
 - 12. Plastic sheeting.
 - 13. Mechanical and electrical equipment.
 - 14. Fluorescent lamps (light bulbs).
 - 15. Acoustical ceiling tile and panels.
- E. Comply with California Green Building Standards Code for Construction Waste Management and Disposal.
- F. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.

- G. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.
- H. The following sources may be useful in developing the Waste Management Plan:
 - 1. State Recycling Department, at www.calrecycle.ca.gov/conDemo/.
- I. Methods of trash/waste disposal that are not acceptable are:
 - 1. Burning on the project site.
 - 2. Burying on the project site.
 - 3. Dumping or burying on other property, public or private.
 - 4. Other illegal dumping or burying.
 - 5. Incineration, either on- or off-site.
- J. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.
- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.03 SUBMITTALS

- A. See Section 01 33 00 - Submittal Procedures.
- B. Submit Waste Management Plan within 10 calendar days after receipt of Notice of Award of Bid, or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to landfilling.
- C. Waste Management Plan: Include the following information:
 - 1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
 - 2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
 - 3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
 - a. List each material proposed to be salvaged, reused, or recycled.
 - 4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
 - 5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging. Whether recyclable materials will be collected via site separated bins or in co-mingled bins.
 - 6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.
- D. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
 - 1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
 - 2. Submit Report on a form acceptable to Glendale Unified School District.
 - 3. Landfill Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
 - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and

cost.

4. Recycled and Salvaged Materials: Include the following information for each:
 - a. Identification of material, including those retrieved by installer for use on other projects.
 - b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
 - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
5. Material Reused on Project: Include the following information for each:
 - a. Identification of material and how it was used in the project.
 - b. Amount, in tons or cubic yards.
 - c. Include weight tickets as evidence of quantity.
6. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 PRODUCTS

2.01 PRODUCT SUBSTITUTIONS

- A. See Section 01 60 00- Product Requirements for substitution submission procedures.
- B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 01 60 00:
 1. Relative amount of waste produced, compared to specified product.
 2. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Sum.
 3. Proposed disposal method for waste product.
 4. Markets for recycled waste product.

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.
- C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.
- D. See Section 01 70 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Glendale Unified School District, and Project Architect.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 - 1. Pre-bid meeting.
 - 2. Pre-construction meeting.
 - 3. Regular job-site meetings.
- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers or contract with waste haulers who will sort waste off-site.
 - 1. Provide containers as required.
 - 2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 - 3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 77 00

CONTRACT CLOSE-OUT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Procedures for closing-out Project.

1.02 RELATED SECTIONS:

- A. Closeout Submittals: See Respective Specification Sections.

1.03 GENERAL:

- A. As a prerequisite for final payment release, Contractor shall complete the work of this Section.
- B. Comply with requirements stated in Conditions of the Contract and in Specifications for administrative procedures in closing out the Work.

1.04 PRE-FINAL INSPECTION; SUBSTANTIAL COMPLETION:

A. Pre-final Inspection:

1. Upon "substantial completion" of the Work AS AGREED TO BY Contractor, Architect/Engineer, DSA Inspector of Record and District Project Manager, Contractor shall notify Architect/Engineer, and DSA Inspector and request a "pre-final inspection" of the Work.
2. If Architect/Engineer, Inspector, and Project Manger concur that work of the contract project/phase is "substantially complete", he will review and list any items that need to be corrected on a punch list. List will be amended as required to include items on the correction or punch list subsequently observed.

- B. Substantial Completion Defined: "Substantial Completion" of the Work is the status, as approved by the Architect/Engineer when construction is sufficiently complete, in accordance with the Contract Documents, so the District/Owner can occupy or utilize the Work for the use for which it is intended.

1.05 FINAL INSPECTION:

- A. Reference: See Supplementary Conditions.
- B. Final Inspection: When Contractor has complied with above Article at the end of the final phase, Architect/Engineer and DSA Inspector and Project Manager will review the Work and list any items that are not completed or need to be corrected.
- C. Contractor shall complete and/or correct the Work in a timely manner as outlined in the contract documents.

1.06 GUARANTEES:

- A. General: Contractor shall guarantee in writing to District/Owner that:

"Contractor will repair or replace any or all of such work, together with any other adjacent work which may be displaced in connection with such replacement, that may prove to be defective in workmanship or material within a period of one year from the date of

acceptance of the above mentioned structure by the Glendale Unified School District, ordinary wear and tear, and unusual abuse or neglect excepted."

B. Format: Contractor shall submit guarantees typed in the format indicated in "Guarantee Form".

C. Number of Copies: Submit in triplicate (3) to Architect/Engineer with one electronic pdf.

D. Required Guarantees:

1. General: Submit all guarantees listed herein or required by various Spec. Sections.

2. General Guarantee:

a. By General Contractor; For the Entire Work: 1 Year.

3. Specific Guarantees:

<u>SPEC DIVISION</u>	<u>ITEM</u>	<u>TIME PERIOD</u>
a. Division 6	Custom Casework.....	2 Years
b. Division 7	Built-up Roofing.....	10 Years
	All Flashing & Sheet Metal, in connection with roof coverings.....	5 Years
	All Joint Sealants.....	5 Years
	Damp proofing.....	2 Years
c. Division 8	Hollow Metal Doors & Frames	2 Years
	Wood Doors	Lifetime
d. Division 9	Acoustical Ceiling Systems	2 Years
e. Division 10	Porcelain Enamel Liquid Marker Board Surfaces	Lifetime
	Toilet Compartments.....	Lifetime
	Operable Walls	3 Years
	Toilet Accessories	1 Year
f. Division 11	Equipment Projector Screen	1 Year
	Laboratory Equipment and Cabinets.....	Lifetime
g. Division 12	Furnishings Vertical Blinds	Lifetime
h. Division 14	Hydraulic Elevator	1 Year
	Wheelchair Lift	1 Year
i. Division 22	Plumbing	1 Year
j. Division 23	HVAC Systems	1 Year
	Temperature Controls for HVAC Systems	1 Year
k. Division 26	All Electrical Work	1 Year

1.07 WARRANTIES:

- A. General: Comply with Section 017836. Submit all warranties required by various Specification Sections.

1.08 CERTIFICATES:

- A. General: Submit in triplicate (3) all certificates required by various Specification Sections or listed herein, notarized as required.

B. Certificates:

1. Division 8: Finish Hardware installation acceptance.
2. Division 28: Fire Alarm System testing and approval.

1.09 OPERATION AND MAINTENANCE DATA:

- A. General: Submit all manuals required by various Specification Sections or listed herein; three (3) copies each, and one electronic pdf. Provide durable binders, no less than 8-1/2" x 11" in size and provide the following information:

1. Identification on, or readable through, the front cover stating general nature of the manual.
2. Neatly typewritten index at the front of the Manual, furnishing immediate information as to location in the Manual of all data or equipment included.
3. Complete instructions regarding operation and maintenance of all equipment included.
4. Complete nomenclature of all replaceable parts, their part numbers, current cost, and name and address of nearest vendor of parts.
5. Copy of all Guarantees and Warranties issued.
6. Copy of the approved Shop Drawings with all data concerning changes made during construction.

- B. Extraneous data: Where contents of Manuals include Manufacturers' catalog pages, clearly indicate the precise items included in this installation by clouding, or highlighting, and delete, all manufacturers' data with which this installation is not concerned.

1.10 RECORD DRAWINGS:

A. Procedures:

1. Promptly following contract award, General Contractor shall secure from the District one complete set of Drawings. Identify the set as "Record."
2. Timing of Entries: Make entries within 24 hours after receipt of information on any changes by Contractor or Sub Contractors.
3. Contractor shall be responsible for maintaining and recording the changes on the set, and by affixing any related RFI, COR, and/or ASI applicable to the changes.
4. Do not use the "Record" set for any purpose except entry of new data and for review by the Architect. Maintain separate job sets for subcontractors and workers daily use.

5. Maintain the "Record" set at the job site where designated by the Architect/Engineer, in conjunction with the DSA Inspector.
6. Use all means necessary to protect the "Record" set from deterioration, loss or damage until completion of the work.
7. Making entries on Drawings: Using an erasable colored pencil, other than blue or black, not ink or indelible pencil, and clearly describe the change by note and by graphic line as required. Date all entries. Call attention to the entry by a "cloud" around the area or areas affected. In the event of overlapping changes, different colors may be used for each of the changes.
 - a. Changes due to approved change orders may be indicated by referencing the change order number and scope of change in lieu of revising the Drawings.
 - b. The location and depth below finish grade or above ceilings and attic spaces of utilities shall be fully dimensioned and indicated on Drawings. Dimensions shall be taken to building lines or permanent landmarks.
8. The architect's approval of the current status of the "Record" drawings will be a prerequisite to the Architect/Engineer's and DSA Inspector's approval of requests for progress payments and request for final payment release.
 - a. Progress approvals: Prior to submitting each request for progress payments, secure the District DSA Inspector's approval of the status of the "Record" Drawings.
 - b. Prior to submitting request for final payment and final inspection, General Contractor shall submit the "Record Drawing" set to the District DSA Inspector, with transmittal letter, in duplicate, for approval and further processing through the Architect/Engineers for their approval and acceptance, and delivery to the District.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

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 01 78 36

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 SUBMITTAL REQUIREMENTS:

- A. Assemble Warranties, Bonds, and Service and Maintenance Contract, executed by each of the respective Manufacturers, Suppliers, and Subcontractors, and submit to the Architect/Engineer for review and approval before Final Payment will be approved and released.
- B. Number of original signed copies required: Three (3) each and one electronic pdf.
- C. Table of Contents Neatly typed in orderly sequence.
- D. Provide complete information for each item:
 - 1. Product or work Item.
 - 2. Firm, with name of principal, address and telephone number.
 - 3. Beginning date of Warranty, Bond, or Service and Maintenance Contract.
 - 4. Duration of Warranty, Bond of Service, and Maintenance Contract.
 - 5. Provide the following information for District/Owner's Personnel:
 - a) Procedure in case of failure or malfunction.
 - b) Instances which affect Warranty or Bond validity.
 - 6. Contractor, name of responsible principal, address, telephone number and email address.

1.02 SUBMITTAL FORM:

- A. Punch sheets for standard 3-ring binder.
- B. Size: 8-1/2 x 11 inches.
- C. Fold larger sheets to fit into binder.
- D. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS" 1st:
 - 1. Title of Project.
 - 2. Name of Contractor.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. Soil and subsurface investigations were conducted at the site by an independent testing laboratory and a log of borings prepared. The results of such borings are found in the report issued by Salem Engineering, dated December 12, 2011. A copy of this report is available at Architect's and District offices.
- B. This report was obtained by Architect for his own use in designing the Project and is not a part of the Contract Documents. The report and log of borings are available for the Contractor's information, but is not a warranty of the subsurface conditions. The Contractor may use the report at his own risk.
- C. The District and Architect do not assume responsibility for variations in kind, depth, quantity and conditions of soils; they disclaim responsibility for accuracy, true location, and extent of soils investigation that has been prepared by others; and they further disclaim responsibility for interpretation of that data by the Contractor as in projecting soil bearing values, rack profiles, soil stability, and presence, level and extent of underground water.
- D. The Contractor should visit the Site and acquaint himself with site conditions. Prior to bidding, the Contractor may make, at his expense, his own subsurface investigation to satisfy himself with site and subsurface conditions. The Contractor shall obtain authorization of the District, through the Architect, prior to start of borings or subsurface investigations.
- E. A Soils Engineer has been retained by the District to observe the performance of Work under this Division. If, in the opinion of the Soils Engineer, any work performed under this Division does not meet the technical or design requirements stipulated for the Work, make necessary readjustments to his approval. No deviations from the Contract Documents shall be made without specific and written approval of the Soils Engineer.

SECTION 02 30 00
SUBSURFACE EXPLORATION

- F. The Soils Engineer's review of the Contractor's performance does not include review of the Contractor's safety measures in, on, or near the jobsite or connected in any way with the performance of the work of this Division.

PART 2 - PRODUCTS
Not Used.

PART 3 - EXECUTION
Not Used.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Includes:
 - 1. Remove designated items for relocation.
 - 2. Remove items to clear path for new work.
 - 3. Remove excavated soil spoils and construction debris from site.
 - 4. Cap existing irrigation devices at new work.
- B. Related Work:
 - 1. Requirements in Addenda, Alternates, Conditions and Division 1 collectively apply to this work.

1.02 QUALITY ASSURANCE

- A. Demolition shall be in compliance with Title 24 of the California Code of Regulations and conform to the California Building Code, 2010 edition.
- B. Utilities disconnection, capping and re-installation shall be by workmen licensed to perform such work.

1.03 SUBMITTALS

- A. Two (2) copies of permits and notices.
- B. Upon completion of work in this Section, submit record documents recording the extent of active and abandoned underground utilities.

1.04 EXISTING CONDITIONS

- A. Contractor shall contact the local underground service alert company for information on buried utilities and pipelines.
- B. Conduct demolition to minimize interference with adjacent structures, trees and properties.
- C. Provide, erect and maintain temporary barriers and security devices.
- D. Conduct operations with minimum interference to public or private thoroughfares. Maintain egress and access at all times.

- E. Traffic: Conduct site-clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.
- F. Prior to demolition or heavy vehicular activity, examine structures adjacent to the designated demolition, including concrete walks and asphaltic concrete paving. Obtain District Inspector's confirmation by signature for the following:
 - 1. Record on the Project Record Documents any pre-existing conditions that could later be construed as Contractor damage.
 - 2. Document each recorded pre-existing condition with a supporting photograph.
- G. Protection of Existing Utilities: Protect existing utilities, including irrigation system from damage.
 - 1. Contact the local underground service alert company and the District prior to any trenching for determining location of underground utilities/irrigation lines.
 - 2. Contact the District for repair instructions for damaged lines.
 - 3. REPAIR OF HIDDEN DAMAGED PRODUCTS, DISCOVERED BY THE DISTRICT, WILL BE CHARGED DIRECTLY TO THE CONTRACTOR.
- H. Protection of Existing Improvements: Provide protection necessary to prevent damage to existing improvements not indicated to be demolished and/or removed.
 - 1. Protect improvements on adjoining properties and on Owner's property.
 - 2. Restore damaged improvements to their original condition, as acceptable to property owners.
- I. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing.
 - 1. Water trees and other vegetation to remain within limits of Contract Work as required to maintain their health during course of construction operations.

2. Replace damaged trees that are damaged by construction activities.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Verify that structures to be demolished are unoccupied and discontinued in use.
- B. Prevent movement or settlement of adjacent structures. Provide bracing and shoring.
- C. Protect existing landscaping materials, appurtenances and structures, which are noted to remain.
- D. Notify School maintenance personnel and utility authorities to locate and flag underground lines. Disconnect, remove and cap designated utility lines within demolition areas. Obtain release from respective utility companies that utilities have been capped in a safe manner.
- E. Mark location of disconnected utilities. Identify utilities and indicate capping locations on project record documents.

3.02 EXECUTION

- A. Remove excavated soil/rocks in association with the installation of the asphaltic sidewalks and building bases. Dispose of rocks and excavated debris to off-site dump. Top soil shall be stockpiled or spread in accordance with District's wishes at each indicated site.
- B. Asphaltic concrete paving shall be saw cut to a straight line on the demolition border, prior to paving demolition.
- C. Cease operations and notify Architect immediately if adjacent structures appear to be endangered. Do not resume operations until corrective measures have been taken.
- D. Remove and promptly dispose of contaminated, vermin infested or dangerous materials encountered.

- E. Do not burn or bury materials on Site.
- F. Keep work sprinkled to minimize dust. Provide hoses and water main or hydrant connections for this purpose.

3.03 SITE CLEARING

- A. General: Remove shrubs, grass, and other vegetation, improvements, or obstructions, as required, to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots. Removal of trees are not permitted, unless prior approval has been obtained from the Architect and District.
- B. Removal of Improvements: Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction. Saw cut existing paving at boundary of areas to be removed.

3.04 DISPOSAL OF WASTE MATERIALS

- A. Burning on Owner's Property: Burning is not permitted on Owner's property.
- B. Removal from Owner's Property: Remove waste materials and unsuitable or excess topsoil from Owner's property.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. Remove designated building equipment and fixtures.
- B. Remove designated partitions and components.
- C. Identify and cap discontinued utilities.
- D. Carefully demolish and remove from the Site those items scheduled to be so demolished and removed. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified and as necessary to complete the Contract, including, but not limited to, the following items:
 - 1. Protection of existing items to remain.
 - 2. Barricades, lights, signs and safety precautions required by the governing code.
- E. Removal and disposition of material resulting from this work, except items identified by Owner to be salvaged and delivered to School District. Such items shall include, but not be limited to, existing chalkboards, markerboards, clocks, telephones, speakers, that the Owner may wish to retain.
- F. Inventory and removal of existing door hardware and lock cylinders to be delivered to District.

1.02 RELATED WORK

- A. Documents affecting work of this Section include, but are not limited to, General Conditions, Supplementary Conditions, and Division 1 of these Specifications.
- B. Relocation of utility lines and mechanical structures scheduled to remain active.
- C. Site Clearing: Section 31 10 00.
- D. Building Demolition: Section 02 41 16.

1.03 GENERAL REQUIREMENTS

- A. Codes: Perform Work in accordance with appropriate Codes, and California Fire Code, latest edition, "Article 87 - FIRE SAFETY DURING CONSTRUCTION, ALTERATION, OR DEMOLITION OF A BUILDING."
- B. Examine the Site, conditions, and limitations thereon and thereabouts. Bidding shall take into account such conditions and limitations, whether or not the same are specifically mentioned in the Contract Documents, and every bid shall be construed as including whatever sums are needed to complete the Work in every part as shown, described, or reasonably required or implied, and attain the completed conditions contemplated by the Contract. The demolition drawings, including demolition work shown on construction drawings, shall be considered as a guide only. The exact extent of the demolition and reconstruction work shall be determined by a site visit and investigation.
- C. Make note of existing asbestos, including asbestos lined pipes, ductwork and equipment. Removal of asbestos shall be executed by Contractor. Coordinate Work with trades contracted by Owner to execute the asbestos removal.
- D. The use of explosives will not be permitted.
- E. Partial Removal: Items scheduled to be removed and of salvageable value to Contractor may be removed from structure as work progresses. Salvaged items must be transported from site as they are removed. Partial removal is subject to the following conditions:
 - 1. Storage or sale of removed items on site will not be permitted.
 - 2. This excludes items and materials to be stored for Owner.
- F. Unforeseen Conditions: Include in the base bid miscellaneous cutting and patching necessitated as a result of unforeseen conditions. No extra payments based on the pleas of unforeseen conditions will be allowed.
- G. Noise control: Carry on work in a manner which will produce the least amount of noise. Instruct workmen in noise control procedures.

- H. Removal of abandoned lines, vaults, the erasing of easements, and similar work is a responsibility of the local governmental authority having jurisdiction.
- I. Conduct demolition to minimize interference with adjacent building areas. Maintain protected access at all times.
- J. Provide and erect temporary barriers and security devices.

1.04 QUALITY ASSURANCE

Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.05 SUBMITTALS

- A. Schedule: Submit proposed methods and operations of building demolition to Architect for review prior to start of Work. Include in schedule, coordination for shut-off, capping, and continuation of utility services, as required.
- B. Submit five (5) copies of demolition and removal procedures and schedule for Architect's review.
- C. Upon completion of the work in this Section, submit Record Drawings recording the extent of active and abandoned underground utilities. The drawings shall be signed and dated by the Contractor and shall be drawn on reproducible sepia. Submit drawings to Inspector of Record and/or transmittal to Architect.

PART 2 - PRODUCTS

2.01 SALVAGE CONTAINER

- A. Provide one (1) lockable steel container, 8' x 8' x 20'.
- B. Place container where directed by District.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Site Security: Erect chain link fence barricades, warning lights, and signs as required by the governing building code, to protect persons from injury, to prevent trespassing, and to prevent theft or damage due to vandalism.
- B. Erect weatherproof closures for exterior openings as specified in Section 01 50 00.
- C. Notify utility authorities to locate and flag underground lines. Disconnect, remove, and cap designated utility services within demolition areas.
- D. Mark location of disconnect utilities. Identify and indicate capping locations on Project Record Documents.
- E. Avoid cutting existing pipe, conduit, or ductwork serving the building but then scheduled to be removed or relocated until provisions have been made to bypass them.
- F. Protect landscaping and irrigation systems unless scheduled to be altered.
- G. Ensure safe passage of persons around area of demolition. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and persons.
 - 1. Erect temporary covered passageways as required by authorities having jurisdiction.
 - 2. Provide interior and exterior shoring, bracing, or support as required to prevent movement, settlement, or collapse of building structure to remain.

3.02 SURFACE CONDITIONS

Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.03 DEMOLITION

- A. By careful study of the Contract Documents, determine the location and extent of selective demolition to be performed.
- B. In company with the Architect, visit the Site and verify the extent and location of selective demolition to be performed.
 - 1. Carefully identify limits of selective demolition.
 - 2. Mark interface surfaces as required enabling workmen to identify items to be removed and items to be left in place intact.
- C. Prepare and follow an organized plan for demolition and removal of items.
 - 1. Shut off, cap, and otherwise protect existing public utility lines in accordance with the requirements of the public agency or utility having jurisdiction. Review plans, and confer with the Architect, to determine which lines are to be abandoned and which are to be kept active.
 - 2. Completely remove items scheduled to be demolished and removed.
 - 3. Comply with pertinent regulations of governmental agencies having jurisdiction.
- D. Demolished material shall be considered to be property of the contractor and shall be completely removed from the job site. Burning of removed materials from demolished structures will not be permitted on Site.
- E. Demolish in an orderly and careful manner. Protect existing supporting structural members and finishes which are not to be demolished. Unless shown on the Drawings, no structural elements such as rafters, joists, columns, or studs shall be cut without written permission from the Architect and Division of the State Architect (DSA).
- F. Remove and promptly dispose of contaminated, vermin infested, or dangerous materials encountered.
- G. Walls:
 - 1. Remove all existing wall covering including but not limited to vinyl wall covering, wallpaper, ceramic tile, wood paneling, and wall carpet where new finishes are scheduled unless noted otherwise.

2. Cut openings where shown, removing sufficient material for proper installation of repairs and new work. Remove any material chipped or otherwise damaged during demolition operations to neat straight line.
 3. Remove all existing chalkboards, markerboards and tackboards unless shown to remain.
 4. Remove all miscellaneous wood trim and molding where new pinboard is scheduled to facilitate a smooth and continuous surface for the new finish application.
 5. Refer to Section 26 05 00, Electrical Requirements.
- H. Floors and Base:
1. Remove all existing floor covering and mastic including but not limited to carpet, ceramic tile, vinyl composition tile (VCT), sheet vinyl and wood where new finishes are specified unless otherwise noted. New carpeting may be installed over existing VCT. Damaged VCT to be patched and repaired prior to installation of carpet.
 2. Remove sufficient finish flooring to a natural seam including adhesive to present smooth plane, ready for application of new material.
- I. Ceilings:
1. Remove existing finished ceilings and wood furring where new ceilings are scheduled.
 2. Remove all damaged ceiling tile and prepare substrate for new to match existing adjacent material.
- J. Plumbing Fixtures: Remove indicated fixtures, including supplies and traps.
- K. Lighting Fixtures: Remove indicated fixtures.

3.04 POLLUTION CONTROLS

- A. Use water sprinkling, temporary enclosures and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.
1. Do not use water when it may create hazardous or objections such as ice, flooding, and pollution.

- B. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations, as directed by Architect or governing authorities. Return adjacent areas to condition existing prior to start of Work.

3.05 TRAFFIC

- A. Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
- B. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

3.06 UTILITY SERVICES

- A. Maintain existing utilities; keep in service, and protect against damage during demolition operations.
- B. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
- C. Owner will shut-off utilities serving structures. Disconnecting and sealing indicated utilities before starting demolition operations is part of this work.
- D. Locate and protect those irrigation devices which are to remain in use and not be replaced or relocated within the area of demolition or workers' vehicular traffic throughout the entire period of the Project.
- E. Buildings that house public address systems and fire alarm, typically in Administration Buildings are to have power maintained at all times. If power must be interrupted, Contractor must give two (2) weeks prior notice for approval and schedule with District for interruption over weekends or when school is not in session.

3.07 REPLACEMENTS

- A. In the event of demolition of items not so scheduled to be removed and/or replaced, promptly replace such items to the acceptance of the Architect and at no additional cost to District.
- B. Damages: Promptly repair damages caused to adjacent facilities by demolition operations at no additional cost to District.

END OF SECTION

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 be thoroughly 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 Bars 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

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Included:
 - 1. Cast-in-place concrete for the following:
 - a. Supported floors and slabs on fill.
 - b. Foundation walls and footings.
 - c. Equipment pads, Light pole bases, and Flag pole bases.
 - 2. Formwork.
 - 3. Curing and protection.
 - 4. Finishing.
 - 5. Vapor Barrier.

- B. Related Work:
 - 1. Requirements in Addenda, Conditions and Division 1 collectively apply to this work.
 - 2. Earthwork: Section 31 00 00.
 - 3. Asphaltic Concrete Paving: Section 32 12 16.
 - 4. Portland Cement Concrete Paving: Section 32 13 13.
 - 5. Concrete Formwork: Section 03 11 00.
 - 6. Steel Reinforcement: Section 03 21 00.
 - 7. Metal Fabrications: Section 05 50 00.

1.02 SUBSTITUTIONS

Only written approval of Architect, by addenda or change order, will permit substitutions for materials specified. Refer to Section 01 25 13 - Product Options and Substitutions for procedure.

1.03 REFERENCES

- A. ASTM C33/C33M-08 - Concrete Aggregates.
- B. ASTM C94/C94M-10a - Ready-Mixed Concrete.
- C. ASTM C150/CM150-09 - Portland Cement.
- D. ASTM C260-06 - Air-Entraining Admixtures for Concrete.
- E. ASTM C494/C494M-102 - Chemical Admixtures for Concrete.

1.04 QUALITY ASSURANCE

- A. Design Criteria for Formwork:
 - 1. Contractor shall be solely responsible for formwork and shall:
 - a. Design, construct and maintain formwork to safely support loads.
 - b. Obtain governing agency approval.
- B. Testing Agency:
 - 1. On-Site Work: District designated Testing Laboratory.
 - 2. Off-Site Work: Governing agency approved Testing Laboratory.
- C. Requirements of Regulatory Agencies:
 - 1. Codes: Conform to Title 24 of the CCR and conform to CBC, 2010 Edition.
 - 2. Off-Site Work:
 - a. Conform to local governing agency requirements.
 - b. Obtain and pay for permits, licenses and fees.
 - c. Arrange for tests and inspections.
- D. Tests and Inspections: See Section 01 45 00, Quality Control and Testing Services.
- E. Allowable Tolerances for Concrete Surface Smoothness: 1/8" maximum permissible variation from a true plane measured from a 10' straight edge placed anywhere on the surface.
- F. Source Quality Control:
 - 1. Testing Laboratory shall provide continuous inspection at concrete batch plant for structural concrete, defined as follows: Footings, foundation walls, floor slabs-on-grade, and exterior reinforced slabs.
 - 2. Furnish Weighmaster's Certificates for all concrete.

1.05 SUBMITTALS

- A. Concrete Design Mix: Reviewed by Testing Laboratory.
 - 1. Per ACI 318, Section 5.2 and 5.3.
- B. Test Reports: Source and Field Quality Control tests.

- C. Certificates:
 - 1. Weighmaster's Certificates: Per DSA requirements.
 - 2. Certificate for Off-Site Work: Provide for off-site work, per Section 01 77 00, Project Closeout.

- D. Provide product data for specified products, under provisions of Section 01 33 00.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Storage:
 - 1. Cement: Store in weather-tight enclosures and protect against dampness, contamination and warehouse set.
 - 2. Aggregates:
 - a. Stockpile to prevent excessive segregation or contamination with other materials or other sizes of aggregates.
 - b. Use only one supply source for each aggregate stockpile.
 - 3. Admixtures:
 - a. Store to prevent contamination, evaporation or damage.
 - b. Protect liquid admixtures from freezing or harmful temperature ranges.
 - c. Agitate emulsions prior to use.

- B. Deliver Ready-Mixed Concrete in conformance with Title 24, Section 1905A.8 (which refers to ACI 318 Section 5.8).

- C. Formwork Materials:
 - 1. On delivery to Site, place materials in area protected from weather.
 - 2. Store materials above ground on framework or blocking and cover with protective waterproof covering providing for adequate air circulation or ventilation.
 - 3. Handle materials to prevent damage.

1.07 JOB CONDITIONS

- A. Environmental Requirements:
 - 1. Allowable Concrete Temperatures:
 - a. Cold Weather: When depositing concrete in freezing or near-freezing weather, concrete mix temperature shall be

between 50°F and 90°F when cement is added. Maintain a concrete temperature of 50°F minimum for 72 hours after placing, or until concrete has thoroughly hardened. When necessary, heat concrete materials before mixing. Take necessary precautions to protect transit-mix concrete.

b. Hot Weather: 90°F maximum.

B. Protection:

1. Do not place concrete during rain, sleet, or snow unless protection is provided.
2. After placement, protect from injury by elements, traffic, construction operations and other causes.

C. Sequencing, Scheduling: Coordinate work with earthwork, trenching for foundations, underground utilities, plumbing, electrical, mechanical, imbedded items, steel reinforcement and related work of other sections.

PART 2 - PRODUCTS

2.01 MATERIALS; GENERAL

Conform to Codes and additional requirements stated herein.

2.02 BASIC CONCRETE MATERIALS

A. Portland Cement:

1. Type II; per Title 24, Section 1903A.5 and modified ACI 318 Section 3.3.2.
2. Use tested cement only per Section 1903A. Use same cement brand for all exposed work.
3. Recycled content shall be 25% (15% flyash per DSA IR 19-3 and 10% reclaimed aggregate per DSA IR 19-4).

B. Water: Clean, fresh, free of injurious amounts of minerals, organic, substances, salts, acids or alkali.

C. Aggregates:

1. General: Per Title 24, Section 1903A.
2. Aggregates: Per CBC Section 1903A.3.3.
 - a. Fine: Sand; well graded from coarse to fine,

1. 15% Flyash: Per CBC Section 1903A.4, ACI 318-05, ASTM C 618, ASTM C 311 and ASTM C 94.
 - b. Coarse: Uniformly graded from 1/4" to maximum permissible size. Maximum size per Title 24, Section 1903A.3, but not to exceed 1-1/4". See Structural Drawings.
 - c. Combined grading shall meet Table 19A-J, Title 24, Part 2.
3. The nominal maximum size of coarse aggregate shall not be larger than one-fifth the narrowest dimension between sides of forms, nor one-third the depth of slabs, nor three-fourths the minimum clear spacing between individual reinforcing bars or wires, bundles of bars, or Pre-stressing tendons or ducts.

2.03 ADMIXTURES

- A. Inclusion of admixtures in concrete mix is at Contractor's Option and expense. Types shall conform to the following:
 1. Conform to Title 24, Section 1903A.5. Admixtures shall increase workability and reduce water demand.
 2. Acceptable Products:
 - a. Floor slabs-on-grade: Red Label or Anti-Hydro International Inc. or approved equivalent. Mix per manufacturer's recommendations.

2.04 CONCRETE SURFACE TREATMENTS

- A. Liquid Curing Compounds:
 1. General: Conform to ASTM C309-07.
 2. Acceptable Manufacturers: Hunt Process Co., Edoco/Burke Construction Chemicals, Scofield, Sonneborn (Degussa Construction Chemicals); US Spec (US Mix Products Co.).
 3. "Clear", Oxidizing Type (For exterior areas): Hunt "Clear # ARB" as a standard of quality.
- B. Liquid Curing Compound (for interior slabs):
 1. General: Penetrating curing compound.
 2. Acceptable manufacturers: Curranseal, Innerseal.
 3. Acceptable Products:
 - a. Curranseal PM 3300 (714) 641-1121.
 - b. Innerseal DPS; 800-999-9385.
 - c. No other substitutions allowed.

4. Apply penetrating sealer within 24 hours of slab placement while concrete is still "green."
5. Application of compound shall be by a trained applicator acceptable to the compound manufacturer.
6. Provide manufacturer's standard 10 year warranty covering both labor and materials necessary to repair floor slab, repair or replace floor finish if repairs cannot be made.
7. Repair all cracks in interior slabs with "crack chaser" saw, fill crack with sealant. This requirement shall be provided prior to application of finish floor materials and is required to validate manufacturer's 10 year warranty.

2.05 WOOD FORMWORK

- A. Grade Marks and Rules for Lumber and Plywood: Per Specifications Sections 03 11 00 - Concrete Formwork and 06 10 00 - Rough Carpentry.
- B. Boards For Unexposed Concrete and Basic Forms: Douglas Fir, S4S; Standard Grade or better.
- C. Form Coatings and Release Agents:
 1. Per manufacturer's recommendations, suitable for type of form materials and finished concrete surface.
 2. Materials shall not stain or change color of exposed concrete.
 3. Materials shall be compatible with finishes to concrete.

2.06 ACCESSORIES AND MISCELLANEOUS

- A. Non-Shrink Grout (Drypack Under Base Plates): Five Star high early strength grout by U.S. Grout Corporation. The grout shall be mixed and installed in accordance with manufacturer's recommendations. Tensile strength (ASTM C307-03(2008)): 2000 psi; Flexural strength (ASTM C580-02(2009)): 4000 psi.
- B. Epoxy Adhesive: Simpson Strong-Tie Set-XP Epoxy Adhesive or Hilti Equal. Two component solid epoxy system meeting minimum requirements of ASTM C-881/C881M-10 specification for Type I, II, IV, and V, Grade 3, Class B and C.
 1. Compressive Yield Strength: 13,390 psi minimum at 7 days per ASTM D695.

2. Heat Deflector Temperature: 168° (76°C) minimum per ASTM D648-07.
 3. Bond Strength: 4,420 psi at 14 days per ASTM 882.
 4. Codes: ICC-ESR-2508; SBCCI-94145; City of Los Angeles RR25185, RR25120.
- C. Concrete Stair Nosing: Refer to Section 05 50 00 - Metal Fabrications.
- D. Vapor Barrier Membrane under interior concrete slabs:
1. Membrane shall be Sego Wrap 15 mil as manufactured by Stego Industries (949) 257-4100.
 - a. Acceptable Manufacturer: Vaporguard by Reef Industries.
 2. Vapor barrier membrane shall have the following properties.
 - a. Permeance as tested after mandatory conditioning (ASTM E154, Section 8, 11, 12, 13) less than 0.01 Perms.
 - b. Strength: ASTM E1745 Class A.
 - c. Thickness: 15 mils minimum.
 - d. Installation shall be in accordance with ASTM E1643 and manufacturer's instructions.

2.07 MIXES, CONCRETE

- A. Mix Proportioning:
1. General:
 - a. Non-designed Mix, per Title 24, Section 1905A.8 which refers to ACI 318 Section 2.
 - b. Design shall include admixtures and/or additives. Use as approved by DSA.
 - c. Do not add salt, chemicals, or other materials to prevent freezing.
 2. Strengths, Proportions and Criteria: Typical for all locations; except where higher strengths are indicated on the Drawings.
 - a. Strength: 3,000 psi at 28 days; 1,800 psi at 7 days.
 - b. Cement Content: Minimum 6 sacks (94#) cubic yard.
 - c. Slump: Maximum four inches.
- B. Mixing:
1. General: Per Title 24, Section 1905A.8 which refers to ACI 318 Section 5.8 and Section 5.2.
 2. Batch Mixed: Use ASTM C94 batch mixer; or capacity to handle one or more full sack batches. No split-sack batches.

3. Transit Mixed: Per CBC 2010 edition Section 1905A.9 which refers to ACI 318 section 5.9.
4. Mix concrete only in quantities necessary for immediate use.
5. Do not retemper concrete.
6. Discharge wash water from mixer before reloading.
7. Include additives and admixtures.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine excavations for foundations, footings, and structures and examine earthwork operations and subgrade for defects that will adversely affect the execution and quality of work.
- B. Verify anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, held securely, and will not cause hardship in placing concrete.
- C. Do not start work until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Layout: Accurately layout work to properly position elements to lines and levels.
- B. Joining To Previous Pours or Existing Work: Sandblast, roughen and clean existing joining concrete and rebar surfaces to provide a proper bond to new work.
- C. At locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels, and pack solid with epoxy cement.
- D. Slabs-on-Grade:
 1. Refer to Section 31 00 00, Earthwork.
 2. Moisten surface sufficiently to prevent suction of water from concrete mix, except where a membrane is used.
 3. All interior slabs-on grade shall be poured over 6 mil visqueen vapor barrier membrane protected with 1" of sand overlay over

crushed rock porous fill. Vapor barrier shall conform to ASTM E1745-09.

3.03 FORMWORK ERECTION

- A. Scope:
 - 1. General: Concrete shall be cast in forms.
 - 2. Footings: When specifically approved by Architect/Engineer and DSA, earth banks may be used as forms in lieu of wood forms.
- B. Form Face Types: Plywood or horizontal boards.
- C. General Construction:
 - 1. Forms shall be substantial, unyielding, true to line and level; sufficiently tight to prevent leakage; adequately tied and braced; and conform exactly to dimensions of finish concrete.
 - 2. Forms shall provide adequate work clearances, temporary access openings necessary for concrete placement, provisions for attachment to previous work; and provide for stripping without injury to concrete work.
 - 3. Cleanouts: Provide continuous cleanouts on one side at bottom of vertical work (such as walls), and other openings as necessary to facilitate cleaning and inspection of the work.
- D. Fabrication:
 - 1. Nail form faces securely to studs. Space studs to adequately support form faces and prevent bulging. Provide stud or solid backing at joints.
 - 2. Install chamfer strips at exposed corners and edges.
 - 3. Securely fasten chamfers, control joints and other detail work.
- E. Erection:
 - 1. Erect formwork plumb and level; double walls; adequately brace, shore and support; set so finished concrete surfaces will drain.
 - 2. Footings and Foundation Walls: Form both sides; secure to stakes.
- F. Form Coatings and Release Agents: Apply per manufacturer's recommendations to evenly coat contact surfaces.

3.04 EMBEDDED ITEMS

- A. General:
1. Install per Title 24, Section 1906A.
 2. Place accurately; anchor securely to prevent displacement.
 3. No wood to be permanently embedded in concrete, except where indicated.
 4. Coordinate, notify, and provide access for other Specifications Sections to set their required work.
 5. Install doweling with epoxy adhesive per manufacturer's recommendations.
 6. Install safety treads and nosing specified in Section 05 50 00 - Metal Fabrications, embedded in wet concrete mix per the manufacturer's recommendations in the exterior, cast-in-place concrete steps as located on the Drawings.

3.05 CONCRETE PLACEMENT

- A. General: Comply with Title 24, Section 1905A.10 which refers to ACI 318, Section 5.10.
- B. Notify Architect and the Inspector of Record minimum 48 hours prior to commencement of all concreting operations.
- C. Preparation and Inspection Prior to Concrete Placement:
1. Do not place concrete until:
 - a. Footing excavations are clean and dry.
 - b. Steel reinforcement is correctly positioned, securely anchored and cleaned.
 - c. Forms are cleaned, coated, and ties are tightened.
 - d. Embedded items are positioned and anchored.
 - e. Construction joints are cleaned and prepared.
 - f. Subgrade is prepared and moistened.
 - g. Preparations for a pour are completed.
 - h. Work has been inspected.
 2. Inspection: Formwork, steel reinforcement, footing excavations and preparation work, as stated above, to be examined by the IOR and/or Architect/Engineer, prior to pouring concrete.

- D. Placement (per CBC Section 1905A.10):
1. Convey concrete from mixer to final position by method which will prevent separation or loss of material and cause minimum handling.
 2. Place concrete continuously between predetermined construction and control joints.
 3. Regulate rate of placement so concrete remains plastic and flows into position.
 4. Do not use partially hardened or contaminated concrete; and do not use concrete which has been remixed after initial set.
- E. Consolidation:
1. Use hand rodding, spading and tamping.
 2. Vertically insert and remove hand-held tools.
 3. Work concrete thoroughly around reinforcement, embedded items and into all parts of forms.
 4. Consolidate to a dense, uniform mass without voids, rock pockets, or entrapped air. Consolidate each layer.
 5. Mechanically powered vibrators may be used. Such use shall be limited to vertical consolidation of concrete over 8" thick and all walls. Do not use to move concrete laterally or in any other means that may cause aggregate separation.
- F. Slabs, Walks and Flatwork:
1. Lift reinforcement at placement progresses to proper position in slab.
 2. Tamp and screed to required lines and levels.
 3. Depress coarse aggregate with grille-blade tamper.

3.06 FINISHING

- A. Provide concrete formed surfaces to be left exposed with smooth rubbed finish.
- B. Interior Flatwork (Floor slabs):
1. Smooth trowel finish surface texture unless otherwise indicated to receive ceramic tile, terrazzo, a concrete topping, or other surfacing which would benefit from the additional bonding of a comparatively rough surface.
 2. Grind smooth any irregularities or improper levels in finished work.

3.07 FINISHING WALLS AND VERTICAL CONCRETE SURFACES

- A. Scope: Finish walls and vertical concrete surfaces as specified herein, except for school name and office signs. Provide concrete formed surfaces, to be left exposed, with smooth rubbed (sacked) finish.
- B. Exposed Concrete At Tops of Forms:
 - 1. Strike concrete smooth and level.
 - 2. Float and/or trowel to texture comparable to formed surfaces.
- C. Preparation, Formed Surfaces:
 - 1. Remove fins and irregularities while concrete is green.
 - 2. Tie Holes: Fill full and flush with compacted drypack.
 - 3. Surface Defects:
 - a. Cut out blemished and defective areas as directed by Architect.
 - b. Patch flush with drypack, typically, or as directed by Architect.
- D. Cleaning:
 - 1. Exposed Surfaces:
 - a. Remove form coatings, bond breakers and other surface coatings.
 - b. Scrub formed surfaces with solution of 1-1/2 lbs. caustic soda to one-gallon water.
 - c. Scrub smooth wood or waste mold areas with 20% muriatic or hydrochloric acid solution.
 - d. Wash surfaces clean with clear water, immediately after scrubbing.
 - e. If above methods fail to remove all substances, lightly sandblast surfaces clean as directed by Architect.
 - 2. Surfaces With Finish Materials Applied Directly to Concrete: Clean as stated for Exposed Surfaces, except where uncleaned surface will not affect application, bond, performance, or appearance of finish materials.
- E. Sacked Finish on Exposed Concrete:
 - 1. General: Schedule work to complete entire panel, element, or area in one continuous operation.
 - 2. Application:
 - a. Wet surface to control suction of water from grout.

- b. Apply grout mix; uniformly spread and scour to fill depressions.
 - c. While still plastic, sponge rubber float finish surface, and remove excess grout.
3. Sacking: Allow surface to dry, but not completely harden. Then rub vigorously with clean dry burlap to remove loose excess material. Finished surface to have a smooth slick burnished finish (similar to a steel trowel finish) which is free of defects and blemishes.

3.08 PROTECTION AND CURING OF CONCRETE

- A. Protection: Protect work from damage and defacement during construction operations.
- B. Curing:
1. Keep concrete surfaces wet until curing medium is applied.
 2. Flatwork:
 - a. Spray apply specified liquid curing compounds to exterior flatwork (slabs, walks, and similar work).
 - b. Application: Apply uniform, continuous, tightly adhered film, free from pinholes or defects at rate of 1 gallon per 250 sq. ft. Brush out puddles and runs.
 3. The length of time, temperature and moisture conditions for curing concrete shall be in accordance with Section 1905A.11 which refers to ACI 318 Section 5.11.

3.09 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01 45 00, Quality Control and Testing Services.
- B. Inspections:
1. Steel reinforcement.
 2. Structural concrete.
- C. Tests:
1. Concrete slump.
 2. Making concrete compression test cylinders.
 3. Core tests of defective work.

3.10 ADJUSTMENT AND CLEANING

- A. Correction of Defective Work:
 - 1. Work not conforming to Contract requirements shall be removed and replaced except where patching or other remedial work is specifically permitted by Architect. Contractor shall bear costs of correction of defective work.
 - a. Surface patching materials and methods shall be as approved by Architect.
 - b. Structural concrete replacement, strengthening, and repair methods and materials shall be as approved by Architect/Engineer and DSA.
- B. Clean exposed joint surfaces to receive joint sealant per Section 07 92 00.
- C. Clean exposed surfaces prior to acceptance.

3.11 CONSTRUCTION JOINTS

- A. Comply with Section 1906A.4, CBC, latest edition.

END OF SECTION

PART 1 - GENERAL

1.01 REFERENCE

Title 24, California Code of Regulations requires that where high lifting is used the method is to be approved by the Division of the State Architect (DSA).

1.02 DESCRIPTION

- A. The High Lift Grouting Method as developed for use in reinforced concrete block masonry is intended for use on wall construction where openings, block pattern arrangements, special reinforcing steel, or embedded structural steel details do not prevent the free flow of grout or inhibit the use of mechanical vibration to properly consolidate the grout fill in cells or horizontal grout spaces. Horizontal reinforcing should be positioned in a single vertical plane at each curtain steel to allow maximum accessibility to the cell spaces.
- B. The procedure requires that masonry units, reinforcing steel and embedded items will be in place before grouting of the wall voids commences. The work should be so arranged that once grouting of a section of wall is started the grouting is to proceed in lifts without stopping except as noted below until the full height of the prepared section is poured. The waiting period between lifts is to be limited to the time required to obtain an initial consolidation of grout due to settlement shrinkage and absorption of excess water by the masonry units. This also allows for a reduction in hydrostatic pressure of the grout on the masonry unit and reduces the possibility of blowouts.
- C. The grout shall be a high slump workable mix preferably placed by pumping to permit continuous pouring and is to be worked into all voids. Use mechanical vibrators for consolidation. Where job conditions preclude such use, other methods may be employed if approved by the DSA. Because of the high water-cement ratio used in this type of grout, it is essential that the grout be reconsolidated after it has taken on a plastic consistency but prior to taking an initial set. The reconsolidation is intended to overcome settlement shrinkage separations from the reinforcing steel and to promote bond to the masonry unit walls.

SECTION 04 05 16
FILLED CELL CONCRETE MASONRY
HIGH LIFT GROUTING METHOD

- D. A pour is considered as the entire height of grout fill placed in one day and is composed of a number of successively placed grout lifts. A lift is the layer of grout placed in a single continuous operation.
- E. The maximum height of pour is limited by the practical considerations of segregation of grout due to the height of free fall, effect of dry grout deposits left on block projections and reinforcing steel and the ability to effectively reconsolidate the grout. Unless specifically approved otherwise the maximum height of the continuous pour will be done in lifts not exceeding 4 feet up to 12' for 8" walls and 16' for 12" walls. Conform to requirements of CBC Section 2104A.6.1.2.3, and DSA IR 21-2.

1.03 QUALITY ASSURANCE

Materials are to conform to Section 2104A and 2103A, CBC, 2010 Edition, Title 24.

PART.2 - PRODUCTS

2.01 MATERIALS

- A. Gravel Aggregate: Gravel aggregate for grout is to conform to CBC, 2010 Edition, Section 2103A.12.3 which refers to ASTM C404.07, coarse aggregate, except when other gradings are specifically approved by the Architect or Structural Engineer, and the DSA.
- B. Coarse Aggregate: Coarse aggregate is to conform to Section 1903A.3 CBC, Title 24, which refers to modified ACI 318, Section 3.3.2.
- C. Admixture: Use an approved grout admixture of a type that reduces early water loss to the masonry units and produces an expansive action in the plastic grout sufficient to offset initial shrinkage and promote bonding of the grout to interior surfaces of the masonry units. Obtain approval for use of the admixture from the Architect/Engineer and the DSA.
- D. Mortar: Mortar is to comply with the requirements of CBC Section 2103A.8, Title 24; and with the following additional requirements:
 - 1. Place approximately half the required water and sand into the mixer while running.

SECTION 04 05 16
FILLED CELL CONCRETE MASONRY
HIGH LIFT GROUTING METHOD

2. Add cement and the remainder of the sand and water into the mixer in that order and mix for a period of at least two minutes.
 3. Add lime and continue mixing as long as needed to secure a uniform mass.
 4. The total mixing time may not be less than ten minutes.
- E. Grout: The grout mix is to comply with the requirements of Title 24, CBC Section 2103A.12.
1. Sufficient water may be added to make a workable mix that will flow into joints of the masonry without separation or segregation. When grout is to be placed in masonry units with typical rates of absorption, the slump of the grout should be approximately 9" to 10" depending on temperature and humidity conditions.
 2. Where the least lateral dimension of cells to be filled exceed 5", a coarser aggregate may be used in the grout fill of the mix if designed in accordance with Section 1904A, CBC. The maximum size of aggregate is not to exceed 1". The water per sack of cement shall conform to 1904A.1, which refers to ACI 318 Section 4.1, CBC Title 24 to allow for absorption by the masonry units and with sufficient workability to meet the requirements given in the paragraph above.
 3. Grout mixes are to contain an approved admixture conforming to the requirements of this Section and IR 21-2. Use such admixture in accordance with manufacturer's instructions.
 4. Mixing of Grout: The mixing of grout is to conform to the requirements for mixing of concrete, Section 2103A.12, CBC Title 24. Whenever possible mix and deliver grout in accordance with the requirements for transit-mixed concrete. Time the addition of the admixture in strict accordance with the manufacturer's instructions. The procedure used for adding it to the grout mix is to provide for good dispersion.
 5. Certification: The quality and quantities of materials used in transit-mixed grout are to be continuously checked by a qualified person at the location where the materials are measured.
 6. If specified by the Architect or Structural Engineer and approved by the Division of the State Architect, certification concerning quantity of materials may be accepted from a licensed weighmaster in lieu of continuous plant inspection if the following procedures are used to check the quality of the materials to be used in the grout.

- a. Test samples of the aggregate to be used in the grout are to be taken and tested by the testing laboratory in accordance with ASTM C1019-09.
- b. The transit-mixed grout supplier uses a mix design for the proportions of cement, sand, and pea gravel or coarser aggregate prepared or approved by the project Architect/Engineer.
- c. On the first half-day transit-mixed grout is supplied to the job, and at such other times as may be required by the Architect/Engineer, the quantity and quality of materials used in the transit-mixed grout is continuously checked by an approved inspector at the batch plant location. In addition to the quality of the aggregates, the inspector is to verify the quality of the cement.
- d. The licensed weighmaster will certify to each load on a load ticket transmitted to the District's Inspector and furnish an affidavit at the completion of the project.
- e. Tests: Testing of mortar and grout is to conform to the requirements of Section 2105A.4 of CBC, Title 24.

PART 3 - EXECUTION

3.01 CONSTRUCTION

The construction of high lift concrete block masonry work is to conform to the requirements of CBC, Title 24, Section 2104A.5.1.2.3, with the following additional requirements:

- A. Foundations: The contact surface of foundations and floors that are to receive masonry work are to be thoroughly cleaned and roughened in accordance with Section 1906A.4.1, Title 24, CBC before start of laying. Protect the roughened surface during construction to assure a good bond between the grout fill and the concrete surface.
- B. Cleanouts: Conform to the requirements of Section 2104A.5.1.1.3.3, CBC. Provide for each pour by leaving out every other unit in the bottom tier of the section being poured or by cleanout openings in the foundation. The openings are to be made prior to the start of laying and be of sufficient size and location to allow thorough flushing away of mortar droppings and debris. After laying of masonry units is completed, the cells cleaned, the reinforcing positioned and inspection completed, close the cleanouts by inserting face shells of

masonry units or covering the openings with forms. Face shell plugs are to have a two day minimum curing time and be adequately braced during grouting to resist the pressure of the fluid grout.

- C. Reinforcement: Place reinforcing steel accurately in strict accordance with the approved Plans and Specifications. Both horizontal and vertical reinforcing are to be held in position by wire ties or spacing devices near ends and at intervals not exceeding 192 diameters of the reinforcement. Place the horizontal reinforcing as the work progresses. The vertical reinforcing may be dripped into position after the completion of the laying if adequate positioning devices are provided to hold the reinforcement in proper location.
- D. Masonry Units: Use of open end concrete masonry units is preferred wherever possible and is required for stacked bond. Bond beam units are to be used wherever possible to facilitate the horizontal flow of grout and are required at all horizontal bars to provide a minimum vertical opening at cross web 3" high by 3" wide. The concrete masonry units shall not be wetted before laying except in hot, dry areas where the contact surfaces of the units shall be moistened immediately before laying to prevent excessive drying of mortar. Wetting shall be limited so as not to compromise the compressive strength of the mortar. Refer to ASTM C270-97a, Appendix XI, "Selection and Use of Mortar for Masonry Units."
- E. Laying: Conform to the requirements of Section 2104A.5.1.2.1, CBC. Fill head and bed joints solidly with mortar for a distance in from the face of the unit not less than the thickness of the face shell. Care is to be taken in placing the mortar to keep a minimum of droppings from falling into the block cells. Arrange open end concrete masonry units used in stacked bond so the closed ends are not abutting.
- F. Wall Ties and Bracing: Conform to the requirements of Section 2104A.5.1.2.1, CBC. When stacked bond is used or when adequate cross webs between face shells are not provided, ties of heavy gauge wire embedded in the horizontal mortar joints should be provided across continuous vertical joints or between face shells to prevent blowouts due to the hydrostatic pressure of the fluid grout. External ties or braces may also be used for this purpose. During construction, brace the ungrouted walls adequately to resist wind and other forces.

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- G. Mortar Droppings and Overhangs: Thoroughly remove mortar droppings and overhangs from the foundation or bearing surface, cell walls and reinforcing. Acceptable methods for this are by hosing with a jet stream at least twice a day (at mid-day and quitting time) or by providing a 2" or 3" blanket of dry sand over the exposed surface of the foundation, dislodging any hardened mortar from the cell walls and reinforcing with a pole or rod and removing the mortar debris with the sand cover prior to clean up and grouting.
- H. Construction Joints: In the high lift grouting method, intermediate horizontal construction joints are not permitted. Plan the work for one continuous pour of grout to the top of the wall in 4' layers or lifts in the same working day. Should a blowout, a breakdown in equipment, or any other emergency occur, cease the grouting operation. An alternate procedure may be used with the approval of the Architect/Engineer and the DSA. The section of wall to be grouted in any one pour should be limited to a length in which successive lifts can be placed within one hour of the preceding lifts. Vertical control barriers shall be placed between pour sections in locations approved by the Architect/Engineer and the DSA.
- I. Grouting: Conform to the requirements of Section 2104A.5.1.1.3, CBC. To prevent blowouts, pour no grout until the mortar has set and cured. However, grout the walls as soon as possible after mortar has cured to reduce shrinkage, and cracking of the vertical joints. Cleanout closures, reinforcing, bolts and embedded connection items are to be in position before grouting is started. Handle grout from the mixer to the point of deposit in the grout space as rapidly as practical by pumping and placing methods which will prevent segregation of the mix and cause a minimum of grout splatter on reinforcing and masonry unit surfaces not being immediately encased in the grout lift. The grout space in masonry shall be a minimum of 3-1/2 inches. Reinforcing and wire ties shall be embedded in the grout. The thickness of the grout between masonry units and reinforcing shall be a minimum of one bar diameter. Vertical grout barriers or dams shall be built of solid masonry across the grout space the entire height of the wall to control the flow of the grout horizontally. Grout barriers shall not be more than 30 feet apart. Depending upon weather conditions and absorption rates of the masonry units, the lift heights and waiting periods may be varied. Under normal weather conditions with typical masonry units, the individual lifts of grout are limited to 4' in height with a waiting period

between lifts of 30 to 60 minutes. Place the first lift of grout to a uniform height within the pour section and mechanically vibrate thoroughly to fill voids. The grouting team should be organized to enable the vibration to follow closely behind and at the same pace as the pouring operation. After a waiting period sufficient to permit the grout to become plastic but before it has taken any set, the succeeding lift should be poured and alternate cells vibrate 12" to 18" into the preceding lift. Do this in such a manner as to reconsolidate the preceding lift and close any plastic shrinkage cracks or separations from the cell walls. If, because of unavoidable job conditions, the placing of the succeeding lift is going to be delayed beyond the period of workability of the preceding lift, reconsolidate each lift by reworking with the mechanical vibrator as soon as the grout has taken its settlement shrinkage. Repeat the waiting, pouring and reconsolidate steps until the top of the pour is reached. Reconsolidate the top lift also after the required waiting period to fill any space left by settlement shrinkage.

- J. Cleaning Wall: Immediately after the wall has been fully grouted, hose off with water under pressure through a jet nozzle, the scum and stains which have percolated through the blocks and joints.
- K. Curing: Attention should be given to proper curing of the mortar joints as well as the grout concrete pour. The concrete block work and top of grout pour should be kept damp to prevent too rapid drying during hot or drying weather, and drying winds.

3.02 INSPECTION AND CORE TESTS

- A. Inspection: Masonry work is required to be continuously inspected during laying and grouting by an inspector specially approved for the purpose by the DSA. The inspector makes test samples and performs such tests as are required by this Section. The special masonry inspector is to check the materials, details of construction and construction procedure. He will furnish a verified report that, of his own personal knowledge, the work covered by the report has been performed and materials used and installed in every particular in accordance with and in conformity to the duly approved Drawings and Specifications.

PART 1 - GENERAL

1.01 SUMMARY

- A. Work Included:
 - 1. Surface preparation.
 - 2. Complete application of paint to interior and exterior surfaces.
 - 3. Application of finish coats to shop-primed metal surfaces.
 - 4. Surface finish schedule.

- B. Related Work:
 - 1. Requirements in Addenda, Alternates, Conditions, and Division 1 collectively apply to this work.
 - 2. Materials and items which receive: Respective Sections.
 - 3. Factory finished items: Respective Sections.
 - 4. Pavement Marking: Section 32 17 23; traffic paint.
 - 5. Casework: Section 06 40 00.
 - 6. Joint Sealers: Section 07 92 00.
 - 7. Finish Hardware removal and replacement in coordination with painting work: Section 08 71 00.
 - 8. Electrical fixture trim and plates removal and replacement in coordination with painting work: Division 26.

- C. Definitions:
 - 1. DFT: Abbreviation for dry film thickness. The minimum thickness to be applied.
 - 2. Paint: A collective general reference to include materials of every component for finishing systems of every type, and preparation of surfaces for and application of said materials.
 - 3. Rough-Surface Wood: Rough-sawn, re-sawn, or sandblasted woods.

1.02 SUBSTITUTIONS

Only written approval of the Architect, will permit substitutions for materials specified. Refer to Sections 01 25 13 - Product Options and Substitutions.

1.03 QUALITY ASSURANCE

- A. Applicator: Company specializing in commercial painting and finishing with five (5) years experience, and approved by paint manufacturer.

- B. Products shall be V. O. C. compliant with local authorities, South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, current version.
- C. Regulatory Requirements: Conform to applicable code for flame/fuel/smoke rating requirements for finishes.

1.04 SUBMITTALS

- A. Submit according to the provisions of Section 01 33 00.
- B. Samples:
 - 1. Number Required: Three each.
 - 2. Paints and Enamels:
 - a. Typical: Each type, in each selected color; 8" x 10" size on stiff smooth material typical; on sandpaper for rough surfaces.
 - b. Stipple Enamel: Each selected color Architect approved, roller texture on 12" x 24" piece of drywall.
 - 3. Stains, Varnishes, Lacquers: Each finish type on each specie and texture of wood; 8" x 10" size for plywood, 16" length for casing or boards, show clearly each step of finishing process.
 - 4. Make samples by same methods to be used to produce actual work. Samples will be examined for color, texture, and workmanship.
 - 5. Remake and resubmit samples when required for approval.
- C. Product Data: Complete list of paint materials including compliance with South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings, current version; Safe Drinking Water and Toxic Enforcement Act of 1986; Proposition 65, OEHHA.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in sealed containers with manufacturer, brand name, product, and use instructions clearly identified.
- B. Store paint materials at minimum ambient temperature of 45°F and a maximum of 90°F, in well ventilated area, unless required otherwise by manufacturer's instructions.
- C. Handle to prevent damage during storage and use.

1.06 PROJECT CONDITIONS

- A. Environmental Requirements:
1. Follow manufacturer's printed recommendations for product when they are more stringent than limits stated herein.
 2. Do not apply materials when temperature is below 50°F or above 110°F.
 3. Do not apply materials when RH is above 90%.
 4. Provide continuous ventilation as necessary to provide air movement, aid drying, and disperse noxious fumes.
 5. Do not apply paint to wet-applied construction until such work is dry, and acceptable to Architect and paint manufacturer.
 6. Do not apply exterior paint in rainy, damp, misty, smoggy, or excessively windy weather.
 7. Do not apply paint in areas where dust is being generated.
 8. Provide lighting level of 80 footcandles measured mid-height at substrate surface during application.
- B. Protection:
1. Cover or otherwise protect finished work of other trades, work not to be painted concurrently, landscaping, and adjacent property from damage.
 2. When not in use, store paints in designated areas. Keep containers closed. At end of day's work, remove empty containers, paint soaked rags, and debris. Vent fumes. Take precautions to prevent fire.
- C. Sequencing, Scheduling:
1. Coordinate removal and replacement of hardware, electrical fixtures and trim, and related work of other Sections.
 2. Stain, prime, back paint, and pre-finish items before installation as required.
- D. Do not use Project plumbing fixtures or piping systems for the following:
1. Cleaning painting equipment and utensils.
 2. Disposal of waste from cleaning or disposal of paints.

1.07 EXTRA MATERIALS

- A. Provide a one-gallon container of each color and surface texture to Owner.

- B. Label each container with color, texture, and room locations, in addition to the manufacturer's label.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers shall verify that their products conform to latest California Air Resources Board regulations.
- B. Materials used in the work of this Section shall be a proprietary brand of one of the following, unless otherwise specified below.
 - 1. ICI Dulux Paints (Ameritone, Glidden, Sinclair); Cleveland, Ohio 800-984-5444.
 - 2. Dunn-Edwards Corp.; Los Angeles, CA; 800-733-3866.
 - 3. Frazee.
- C. Substitutions: Under provisions of Section 01 25 13.

2.02 ACCEPTABLE MANUFACTURERS AND PRODUCTS

- A. Metal Primers:
 - 1. Rust-Inhibitive Primer (For Ferrous Metals):
 - a. Bloc-Rust Red Oxide Primer 43-4, by Dunn-Edwards.
 - b. Red Oxide Metal Primer #54, by Ameritone
 - c. Alkyd Metal Primer #4100, by Glidden.
 - 2. General Primer (For Ferrous Metals):
 - a. Corrobar White Alkyd Primer 43-5, by Dunn-Edwards.
 - b. Devguard 4160, by Devoe.
 - 3. Aluminum and Galvanized Metal Primer (For Non-Ferrous Metals):
 - a. Galv-Alum Primer 43-7, by Dunn-Edwards.
 - b. Devguard 4120, by Devoe.
 - c. Coor-Tect #34, by Sinclair.
- B. Wood Primers and Sealers:
 - 1. Water-Base Primer (Exterior):
 - a. E-Z Prime, W708, by Dunn-Edwards.
 - b. 2000-1200 Primer, by ICI Paints.
 - 2. Alkyd Primer (Interior):
 - a. Cover-Stain Primer, 03500 Series, by Zinsser.
 - b. Kilz Oil-Base Primer Sealer by Masterchem Industries.
 - 3. Pigmented Shellac Primer: Bin Shellac Base Primer Sealer, by Zinsser.
 - 4. Sanding Sealer: MC80-6200 (McClosky), by Dunn-Edwards.

- C. Masonry Fillers and Sealer:
 - 1. Standard Concrete Block Filler: Bloc-Fil W305, by Dunn-Edwards.
 - 2. Heavy Concrete Block Filler: Bloc-Fil W305, by Dunn-Edwards.
 - 3. Masonry Sealer:
 - a. Eff-Stop Acrylic Masonry Primer/Sealer W709, by Dunn-Edwards
 - b. Dulux Exterior Latex Primer 2001-1200, by ICI Paints.

- D. Gypsum Board Sealer:
 - 1. Vinylastic Interior Pigmented Sealer W101, by Dunn-Edwards.
 - 2. Prep & Prime Gripper Multi-Purpose 3210-1200, by ICI Paints.

- E. Acoustical Tile Sealer:
 - 1. Cover-Stain Primer by Zinsser.
 - 2. Kilz Oil Base Primer Sealer by Masterchem Industries.

- F. Concrete Floor Sealer:
 - 1. General: Penetrating acrylic, semi-transparent sealer.
 - 2. Permaseal by Monochem, Los Angeles, CA; 818-500-8585.

- G. Latex Enamel Paints:
 - 1. Acrylic Latex Enamel - Semi-Gloss:
 - a. Permasheen W901-1, by Dunn-Edwards.
 - b. Dulux Professional Exterior 100% Acrylic, by ICI Paints.
 - 2. Exterior Masonry – Flat:
 - a. Evershield W701-1, by Dunn-Edwards
 - b. Masonry Flat Finish, 2220, by ICI

- H. Acoustical Tile Paint – Flat:
 - 1. Acoustikote W615, by Dunn-Edwards.
 - 2. 1802, by ICI Paints.

- I. Polyurethane Coatings:
 - 1. Water-Base Polyurethane, Satin Finish:
 - a. MC8-6841 (McClosky 6841 Series), by Dunn-Edwards.
 - b. 1802, by ICI Paints.
 - 2. Solvent-Base Polyurethane, Gloss Finish: Interthane 990HS, by International Protective Coatings, Houston, TX: 713-682-1711.

- J. Solvent-Base Epoxy Paint: Interseal 670HS, by International Protective Coatings, Houston, TX; 713-682-1711.

- K. Fire Retardant Coating: Flat Latex Intumescent Coating, 320A by Barnard Products Inc., Covina, CA; 800-232-1285.

2.03 MATERIALS

- A. Each material type to be same manufacturer throughout. Materials in a coating system to be by a single manufacturer.
- B. Ready mixed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
- C. Coatings shall have good flow and brushing properties; capable of drying or curing free of streaks or sags.
- D. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

2.04 MIXES

- A. Follow manufacturer's printed recommendations.
- B. Mix paints thoroughly prior to application.
- C. Mix only in Inspector's presence, in assigned spaces.
- D. Except where thinning is specifically recommended by manufacturer, do not thin products.

2.05 FINISHES

- A. Refer to schedule at end of Section for surface finish schedule.
- B. Colors:
 - 1. As selected by Architect, from Manufacturer's standard and custom colors and finish selection charts.
 - 2. A number of colors (8 minimum to 12 maximum) will be selected, arranged in various combinations, used to accent trim and other architectural features, and colors and combinations will vary from exterior-to-interior, space-to-space, surface-to-surface, material-to-material, and feature-to-feature.
 - 3. Colors to be factory mixed, and to match approved samples.

4. Tint undercoats sufficiently different so they are readily distinguishable, in any light, from each other and the finish coat.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine surfaces for suitability to receive paint. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 1. Plaster and Gypsum Wallboard: 12 percent.
 2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
 3. Interior Located Wood: 15 percent, measured in accordance with ASTM D2016.
 4. Exterior Located Wood: 19 percent, measured in accordance with ASTM D2016.
 5. Concrete Floors: 7 percent.
- D. Beginning of installation means acceptance of existing surfaces.

3.02 PREPARATION – NEW SURFACES

- A. General:
 1. Remove all manufacturer's labels, tags, electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or finishing.
 2. All specified products are to be stored, handled, and used per manufacturer's printed instructions and recommendations.
 3. Correct all surface defects, which may adversely affect the finished work.
 4. Clean all surfaces prior to sealer or primer application. Surfaces to be free of all loose coating, dust, corrosion and other foreign matter.

- B. Metal:
1. Shop Primed Structural Steel:
 - a. Thoroughly clean all surfaces utilizing SSPC-SP No. 2 Hand Cleaning or SSPC-SP No. 3 Power Brush Cleaning method.
 - b. Sand all rough areas to provide smooth, uniform surface. Spot prime abraded, damaged, and unprimed areas with Rust Inhibitive Primer.
 2. Shop Primed Non-Structural Steel:
 - a. Thoroughly clean all surfaces.
 - b. Sand all rough areas to provide smooth, uniform surface. Spot prime abraded, damaged, or unprimed areas with Rust Inhibitive Primer.
 3. Galvanized Steel:
 - a. Thoroughly clean all surfaces utilizing SSPC-SP No. 1 Solvent Cleaning method.
 - b. Etch all surfaces with application of Dunn-Edwards Galva-Etch GE-123 solution as follows. Thinning: Use water. Do not reduce solution beyond three parts water to one part Galv-Etch. Application: Brush or mop apply in a thin even coat. After five minutes, remove excess solution with rags, squeegee or sponge. Drying Time: 1/2 hour minimum and 4 hours maximum before priming.
 4. Drinking Fountain Steel Pipe Guardrails (Powder Coating):

Chemical conversion coating or sand blast all surfaces per Powder Coating manufacturer's printed guidelines.
- C. Wood Work:
1. Painted Wood:
 - a. Thoroughly clean all surfaces.
 - b. Seal knots, pitch spots and resinous areas with Pigmented Shellac Primer.
 - c. Fill all nail and screw holes, open joints, cracks and defects with putty. Install putty after prime coat application. Spot prime all fill areas with Water-Base Primer at exterior locations and Alkyd Primer at interior locations.
 - d. Except for rough sawn lumber and plywood, sand surfaces to a smooth, uniform finish with No. 150 grit sand paper.
 2. Wood With Transparent Finish:
 - a. Thoroughly clean all surfaces.
 - b. Fill all nail and screw holes, open joints, cracks and defects with putty. Putty color to match final finish color.
 - c. Sand to a smooth, uniform finish with No. 220 grit sand paper.

- D. Concrete:
 - 1. Remove all dirt, concrete dust and foreign matter from all surfaces. Remove rust stains with a solution of sodium metasilicate after thoroughly wetting with water.
 - 2. Remove curing compounds and release agents with light sand blast or high pressure power wash.

- E. Masonry: Remove all dirt, mortar dust, and foreign matter from masonry and joints.

- F. Plaster:
 - 1. Thoroughly clean all surfaces.
 - 2. Wash and neutralize high alkali surfaces.

- G. Drywall: Thoroughly clean all surfaces.

- H. Concrete Floors (Receiving Coating):
 - 1. Patch all cracks and defects with thin-set concrete patch per Section 03 30 00.
 - 2. Thoroughly clean all surfaces per coating manufacturer's printed requirements.

- I. Factory Finished Products and Equipment:
 - 1. Remove all incidental adhesive applied labels and label adhesive. Equipment information and data labels and plates to remain.
 - 2. Thoroughly clean all surfaces with mineral spirits.
 - 3. Dull glossy paint surfaces by sanding or application of liquid deglossing surface conditioner.

- J. Mildew Treatment: If mildew is present, treat mildew area with spray-on solution of 50% bleach and 50% water. Let surface dry. Spot prime area with Alkyd Primer.

- K. Removal of Grease, Oil and Other Contaminants: Remove oil, grease and similar type contaminants with mineral spirits, ammonia-based cleaners or trisodium phosphate (TSP) solution. Provide adequate ventilation during use. Allow surfaces to dry prior to primer application.

3.03 PREPARATION – EXISTING SURFACES

A. General:

1. Remove all electrical plates, hardware, light fixture trim and fittings prior to preparing surfaces or finishing.
2. Correct all surface defects which may adversely affect the finished work.
3. Clean all surfaces prior to primer or finish application. Surfaces to be free of all dust, corrosion and other foreign matter.
4. Refer to Paragraph 3.02 for preparation of existing construction not previously finished.

B. Metal:

1. Painted Iron and Steel:
 - a. Power wash all exterior surfaces. Thoroughly clean all interior surfaces.
 - b. Remove all loose, peeling or chalky paint and rust by scraping, hand brushing, power brushing, sanding and/or grit blasting to expose bare metal. Smooth exposed paint edges by sanding. Spot prime exposed metal surfaces with Rust Inhibitive Primer or General Metal Primer. Spot prime exposed galvanized surfaces with Galvanized Metal Primer. Primers to be applied same day that metal is exposed.
 - c. At depressions and dents in steel hollow metal doors, door frames and window frames sand area completely and fill depression or dent with body filler. Prime body filler areas with Rust Inhibitive Primer or General Metal Primer.
 - d. Sand all rough areas to provide smooth, uniform surface. Dull glossy paint surfaces by sanding or application of liquid deglossing surface conditioner.
2. Galvanized Steel:
 - a. Remove all rust by sanding or grit blast to expose bare metal. Spot prime exposed metal with Galvanized Metal Primer.
 - b. Clean and etch all surfaces per Paragraph 3.02.
3. Aluminum: Thoroughly clean all surfaces.

C. Wood Work:

1. Painted Wood:
 - a. Power wash all exterior surfaces. Thoroughly clean all interior surfaces.

- b. Remove all loose, peeling or chalky paint by scraping and/or sanding. Smooth paint edges and remove weathered wood to expose sound wood surface by sanding. Spot prime exposed wood areas with Water-Base Primer at exterior locations and Alkyd Primer at interior locations.
 - c. Fill all holes, scratches, depressions, and cracks with putty.
 - d. Sand all rough areas to provide smooth, uniform surface. Dull glossy paint surfaces by sanding or application of liquid deglossing surface conditioner.
2. Wood With Varnish or Lacquer Finish to be Painted (Interior):
 - a. Thoroughly clean all surfaces.
 - b. Fill all holes, scratches, depressions, and cracks with putty.
 - c. Sand all rough areas to provide smooth, uniform surface. Sand all surfaces with No. 150 grit sand paper.
 3. Wood With Varnish or Lacquer Finish to be Re-Coated (Interior):
 - a. Thoroughly clean all surfaces.
 - b. Repair all damaged areas.
 - c. Fill all holes, scratches, depressions, and cracks with putty. Color of putty to match wood color.
 - d. Sand all rough areas to provide smooth, uniform surface. Sand all surfaces with No. 220 grit sand paper.
 4. Deteriorated, Rotted or Insect Damaged Wood: Replace all deteriorated, rotted, and insect damaged wood with wood type matching existing wood. Refer to Section 06 10 00 - Rough Carpentry and Section 06 20 00 - Finish Carpentry for replacement wood requirements. Prepare replacement wood per Paragraph 3.02,C.
- D. Concrete and Masonry:
1. Power wash all exterior surfaces. Thoroughly clean all surfaces.
 2. Remove all loose, peeling or chalky paint by scraping, hand brushing, power brushing and/or sanding. Patch all cracks, voids and spalled off areas in concrete with thinset concrete patch per Section 03 30 00. Patch all cracks, voids and spalled off areas in masonry with masonry patch. Patch to match texture of existing adjacent surface. Spot prime exposed concrete or masonry and patch areas with Concrete Sealer.
 3. Sand all rough areas to provide smooth, uniform surface. Dull glossy paint surfaces by sanding or application of liquid deglossing surface conditioner.

- E. Plaster:
1. Power wash all exterior surfaces. Thoroughly clean all interior surfaces.
 2. Remove all loose, peeling or chalky paint by scraping, hand brushing, power brushing and/or sanding. Patch all cracks, voids and spalled off areas with plaster patch. Replace large areas of deteriorated or damaged plaster per Section 09 24 00 - Portland Cement Plaster. Patch to match texture of existing adjacent surface. Spot prime exposed plaster and patch areas with Concrete Sealer.
- F. Drywall:
1. Thoroughly clean all surfaces.
 2. Remove all loose, peeling, flaking and scaling paint by scraping and/or sanding. Provide fiberglass tape at cracks and finish with three (3) coats of Standard Tape and Joint Compound. Fill all holes, paint spall off areas, voids, and damaged areas with Standard Tape and Joint Compound. Spot prime patch and fill areas with Gypsum Board Latex Sealer. Spot prime all oil and water stained surfaces with Alkyd Primer.
 3. Sand all rough areas to provide smooth, uniform surface. Dull glossy paint surfaces by sanding or application of liquid deglossing surface conditioner. Do not raise nap on gypsum board paper covering.
- G. Concrete Floors (Receiving Coating):
1. Patch and repair all cracks and defects with thin-set concrete patch.
 2. Provide bead blast of floor surface per coating manufacturer's requirements.
 3. Thoroughly clean all surfaces.
- H. Mildew Treatment: If mildew is present treat mildew area with spray-on solution of 50% bleach and 50% water. Let surface dry. Spot prime area with Alkyd Primer.
- I. Removal of Grease, Oil, and Other Contaminants: Remove oil, grease and similar type contaminants with mineral spirits, ammonia-based cleaners or trisodium phosphate (TSP) solution. Provide adequate ventilation. Allow surfaces to dry prior to primer application.

3.04 PROTECTION

- A. Protect elements surrounding the work of this Section from damage or disfiguration.
- B. Repair damage to other surfaces caused by work of this Section.
- C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- D. Remove empty paint containers from site.

3.05 APPLICATION

- A. Workmanship:
 - 1. Execute work with skilled craftsmen.
 - 2. Evenly apply coats, with suitable equipment, well flowed on, free of laps, runs, skips, dead spots, and other imperfections. Last coat to present a uniform surface, color, and texture.
 - 3. Stipple texture to be as approved by Architect.
 - 4. Apply products in accordance with manufacturer's instructions if more stringent than limits specified herein.
 - 5. Do not apply finishes to surfaces that are not dry.
- B. Equipment: Brushes, rollers, and spraying equipment as required and suitable for material being applied; keep clean and in proper operating condition. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- C. General:
 - 1. Paint and color areas per Architect's Color Schedules.
 - 2. Mask and cut-in as required to accomplish the various color combinations. Make edges of paint clean and sharp (no overlaps) where they adjoin other colors or materials.
 - 3. Paint entire surfaces, parts, and items including reveals, returns, rabbets, soffits, projections, openings, and ornamental features.
 - 4. Allow applied coat to dry within paint manufacturer's recommended limits before next coat is applied.
- D. Number Of Coats:
 - 1. Specified number is the minimum number to be applied.
 - 2. Contractor shall, at his expense, apply additional coats as directed by Architect if:

- a. Contractor does not produce full even coverage.
 - b. Contractor does not meet required dry film thickness with specified number of coats.
 - c. Contractor applies a coat before Inspector has examined previous coat.
- E. Dry Film Thickness stated in Schedule of Paint Finishes must be increased to manufacturer recommended thickness when such exceeds the thickness stated herein.
- F. Minimum drying time between coats shall be the most stringent of the following conditions:
1. Until coat is dry.
 2. Manufacturer's printed recommendations.
 3. Three (3) days for exterior work, two (2) days for interior work, except where other time requirements are specifically stated in manufacturer's printed recommendations.
- G. Preparation Work Between Coats: Prepare each coat to receive succeeding coat.
1. General: Repair defects, sand, dust, wipe clean.
 2. Wood, Enameled: When dry, lightly sand smooth.
 3. Wood, Varnished or Lacquered: When dry, steel wool smooth.
 4. Plaster and Concrete: Neutralize suction spots or hot spots; then touch-up so coat surface is uniform.
- H. Back-Priming:
1. Immediately upon delivery to Project site, back prime surfaces which will be concealed after installation for following items: Exterior and interior finish lumber and millwork, doorframes, trim, plywood wall lining and paneling.
 2. Painted and Enameled Work: One coat clear sealer.
 3. Wood With Stained Finish: One coat linseed oil.
 4. Keep back-priming off exposed faces.
- I. Priming:
1. General: Prime work as soon as possible after surfaces are prepared.
 2. Ungalvanized Steel: Prime immediately after cleaning, on the same day.
 3. Galvanized Sheet Metal: Prime immediately after erection.
 4. Exterior and Interior Woodwork: Prime immediately after erection.

5. At Glazing: Paint glass beads, stops and rabbets, except for aluminum.
- J. Application Methods: Apply by brush or roller, except as listed below.
 1. Enamel to Doors: Roller only.
 2. Enamel: Roller typically.
 3. Stipple Enamel: Roller only, with Architect approved texture.
 4. Varnish or Lacquer: Spray.
 5. Exterior Wood Stains: Apply by brush or roller only. Work well into surface, especially on rough-surface woods.
- K. Doors: Finish faces, edges, top, and bottom. On wood doors, apply first coat to all parts at the same time. At exterior doors, paint interior face with same material used on the exterior face.
- L. Colors: Make color changes at inside corners typically. Paint to a clean straight line.

3.06 PAINTING OF MECHANICAL AND ELECTRICAL ITEMS AND EQUIPMENT

- A. Painting of factory finished items and equipment is not required unless specifically called out herein or on the drawings.
- B. Paint the following:
 1. Interior exposed mechanical pipes ductwork, hangers, brackets, collars, and supports.
 2. Interior surfaces of ductwork that are visible through grilles, registers, and louvers. Paint flat black. Paint exposed to view dampers behind grilles, registers, and louvers to face grilles, register, or louver color.
 3. Exposed plumbing piping, hangers, fasteners, and supports visible from the ground.
 4. Interior exposed electrical conduit, boxes, hangers, fasteners, and supports visible from the ground.
 5. Electrical panel and telephone backboards. Paint both sides and all edges of backboards. Painting to occur prior to equipment installation.
 6. All unfinished mechanical and electrical items and equipment.
 7. All primed mechanical and electrical items and equipment.
- C. Do not paint equipment nameplates, identification information, and/or labels.
- D. Refer to Division 15 for pipe identification requirements.

3.07 FIELD QUALITY CONTROL

- A. Notify Inspector of Record (IOR) when work is ready for examination. Examination of work shall occur at the following stages:
 - 1. Surface preparation, prior to application of prime coat.
 - 2. Each coat, prior to application of succeeding coat.
 - 3. Final coat, and finished work.
- B. Do not proceed with next operation until required examination has been made.

3.08 ADJUSTING AND CLEANING

- A. Cleaning:
 - 1. Clean surfaces as work progresses.
 - 2. Remove paint spillage and droppings, and stains promptly.
 - 3. Do not use tools or cleaners, which will mar finish of item being cleaned.
 - 4. Leave work and paint storage area clean and free of unnecessary accumulation of tools, equipment, surplus materials, and debris resulting from this work.
- B. Correction of Defective Work:
 - 1. Repair abraded, damaged, or incomplete paint surfaces by methods acceptable to Architect. Spot repairs to be well blended into adjacent work. For large repairs, re-coat entire plane or building element in which damaged area occurs.
 - 2. Defaced surfaces of work not to be painted, shall be cleaned and their original finish restored.
- C. Collect cotton waste, cloths, and material, which may constitute a fire hazard. Place in closed metal containers and remove daily from site.

3.09 SCHEDULE OF PAINT FINISHES – NEW SURFACES

- A. Metal:
 - 1. Shop Primed Structural Steel (Exposed on Building Exterior):
 - a. Coat 1: Acrylic Latex Enamel, Semi-Gloss.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Total DFT: 3.0 mils.
 - 2. Shop Primed Structural Steel (Exposed on Building Interior):
 - a. Coat 1: Acrylic Latex Enamel, Semi-Gloss.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.

- c. Total DFT: 3.0 mils.
 3. Shop Primed Non-Structural Steel:
 - a. Coat 1: Acrylic Latex Enamel, Semi-Gloss.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Total DFT: 3.0 mils.
 4. Galvanized Metal:
 - a. Coat 1: Galvanized Metal Primer. Apply Coat 1 within 4 hours of preparation work completed.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Coat 3: Acrylic Latex Enamel, Semi-Gloss.
 - d. Total DFT: 5.0 mils.
 5. Factory Finished Products and Equipment (See Respective Specification Sections).
 - a. Coat 1: Acrylic Latex Enamel, Semi-Gloss.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss..
 - c. Total DFT: 3.0 mils.
 6. Visible Roof-Top Equipment: Paint per requirements of Factory Finished Products and Equipment or per Metal type.
 7. Gas Piping:
 - a. Coat 1: Rust Inhibitive Primer.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Coat 3: Acrylic Latex Enamel, Semi-Gloss.
 - d. Total DFT: 5.0 mils.
 8. Drinking Fountain Steel Pipe Guardrails:
 - a. 1 coat TGIC polyester powder coating. Coating application to be per coating manufacturer's printed instructions and recommendations.
 - b. Total DFT : 2.0-4.01 mils.
- B. Wood Work:
 1. Wood Work (Exterior):
 - a. Coat 1: Alkyd Primer.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Coat 3: Acrylic Latex Enamel, Semi-Gloss.
 - d. Total DFT: 4.5 mils.
 2. Millwork (Interior, Paint Finish):
 - a. Coat 1: Alkyd Primer:
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Coat 3: Acrylic Latex Enamel, Semi-Gloss.
 - d. Total DFT: 4.5 mils.
 3. Doors, Casework, and Millwork (Interior, Transparent Finish):
 - a. Coat 1: Oil Stain.
 - b. Coat 2: Sanding Sealer, Light sand with No. 220 sand paper.

- c. Coat 3: Water-Base Polyurethane, Satin Finish.
 - d. Coat 4: Water-Base Polyurethane, Satin Finish.
 - e. Total DFT: 3.0 mils.
 - 4. Painted Plywood Back Board at Electrical Equipment:
 - a. Coat 1: Fire Retardant Coating, 150 SF per gallon.
 - b. Coat 2: Fire Retardant Coating, 150 SF per gallon.
- C. Concrete:
- 1. Concrete (Exterior):
 - a. Coat 1: Masonry Sealer.
 - b. Coat 2: Exterior Masonry Latex Enamel, Flat.
 - c. Coat 3: Exterior Masonry Latex Enamel, Flat.
 - d. Total DFT: 4.5 mils.
 - 2. Concrete (Interior):
 - a. Coat 1: Masonry Sealer
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Coat 3: Acrylic Latex Enamel, Semi-Gloss.
 - d. Total DFT: 4.5 mils.
- D. Masonry:
- 1. Masonry (Exterior):
 - a. Coat 1: Standard Concrete Block Filler. DFT: 8.0 mils.
 - b. Coat 2: Exterior Masonry Latex Enamel, Flat.
 - c. Coat 3: Exterior Masonry Latex Enamel, Flat.
 - d. Total DFT Coats 2 and 3: 3.0 mils.
 - 2. Masonry (Electrical Switch & Transformer Enclosure Interior Side):
 - a. Coat 1: Heavy Concrete Block Filler.
 - b. Coat 2: Solvent-Base Epoxy. DFT: 4.0 – 8.0 mils.
 - c. Coat 3: Solvent-Base Polyurethane, Gloss Finish. DFT: 2.0 – 3.0 mils.
 - 3. Masonry (Interior):
 - a. Coat 1: Standard Concrete Block Filler. DFT: 8.0 mils.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Coat 3: Acrylic Latex Enamel, Semi-Gloss.
 - d. Total DFT Coats 2 and 3: 3.0 mils.
- E. Plaster:
- 1. Plaster (Exterior):
 - a. Coat 1: Masonry Sealer.
 - b. Coat 2: Exterior Masonry Latex Enamel, Flat.
 - c. Coat 3: Exterior Masonry Latex Enamel, Flat.
 - d. Total DFT: 4.5 mils.

2. Plaster (Trash and Dumpster Enclosure Interior Side):
 - a. Coat 1: Masonry Sealer. DFT: 1.5 mils.
 - b. Coat 2: Solvent-Base Epoxy. DFT: 4.0 – 8.0 mils.
 - c. Coat 3: Solvent-Base Polyurethane, Gloss Finish. DFT: 2.0 – 3.0 mils.
 3. Plaster (Interior):
 - a. Coat 1: Masonry Sealer.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Coat 3: Acrylic Latex Enamel, Semi-Gloss.
 - d. Total DFT: 4.5 mils
- F. Drywall:
1. Drywall (Typical):
 - a. Coat 1: Gypsum Board Sealer.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss, Stipple Roller Finish.
 - c. Coat 3: Acrylic Latex Enamel, Semi-Gloss, Stipple Roller Finish.
 - d. Total DFT: 4.5 mils.
 2. Drywall Receiving Pinboard:
 - a. Coat 1: Gypsum Board Sealer.
 - b. DFT: 1.5 mils.
- G. Concrete Floor Sealer:
1. Coat 1: Floor Sealer. One gallon per 230-360 square feet.
 2. Coat 2: Floor Sealer. One gallon per 300-350 square feet.
- H. Court Striping on Wood Sports Flooring:
1. White Striping: 2 coats Acrylic Latex Striping Paint.
 2. Yellow Striping: 1 coat white and 1 coat yellow Acrylic Latex Striping Paint.
 3. Red Striping: 2 coats Acrylic Latex Striping Paint.
 4. Blue, Black, and Green Striping: 1 coat Acrylic Latex Striping Paint.

3.10 SCHEDULE OF PAINT FINISHES – EXISTING SURFACES

- A. General:
1. Refer to Paragraph 3.09 for required paint finishes on existing unpainted materials, products and equipment.
 2. Existing surface mounted conduit and electrical boxes on surfaces called out to be painted are to be painted also.
 3. Existing air distribution diffusers and returns on surfaces called out to be painted are to be painted also.

- B. Metal:
1. Previously Painted Steel:
 - a. Coat 1: Acrylic Latex Enamel, Semi-Gloss.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Total DFT: 3.0 mils.
 2. Galvanized Metal:
 - a. Coat 1: Galvanized Metal Primer. Apply Coat 1 within 4 hours of Preparation work completion.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Coat 3: Acrylic Latex Enamel, Semi-Gloss.
 - d. Total DFT: 5.0 mils.
 3. Aluminum:
 - a. Coat 1: Aluminum Primer.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss. Apply Coat 2 within 48 hours of Primer application.
 - c. Coat 3: Acrylic Latex Enamel, Semi-Gloss.
 - d. Total DFT: 5.0 mils.
- C. Wood Work:
1. Previously Painted Items (Exterior):
 - a. Coat 1: Acrylic Latex Enamel, Semi-Gloss.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Total DFT: 3.0 mils.
 2. Previously Painted Doors, Casework, and Millwork (Interior):
 - a. Coat 1: Acrylic Latex Enamel, Semi-Gloss.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Total DFT: 3.0 mils.
 3. Doors, Casework, and Millwork with Varnish or Lacquer Finish (Interior):
 - a. Coat 1: Alkyd Primer.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Coat 3: Acrylic Latex Enamel, Semi-Gloss.
 - d. Total DFT: 4.0 mils.
 4. Doors, Casework, and Millwork (Interior Transparent Finish Re-Coat):
 - a. Coat 1: Water-Base Polyurethane, Satin Finish.
 - b. Coat 2: Water-Base Polyurethane, Satin Finish.
 - c. Total DFT: 2.0 mils.
- D. Concrete and Masonry:
1. Previously Painted Concrete and Masonry (Exterior):
 - a. Coat 1: Exterior Masonry Latex Enamel, Flat.
 - b. Coat 2: Exterior Masonry Latex Enamel, Flat.

- c. Total DFT: 3.0 mils.
 - 2. Previously Painted Concrete and Masonry (Interior):
 - a. Coat 1: Acrylic Latex Enamel, Semi-Gloss.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Total DFT: 3.0 mils.
- E. Plaster:
 - 1. Previously Painted Plaster (Exterior):
 - a. Coat 1: Exterior Masonry Latex Enamel, Flat.
 - b. Coat 2: Exterior Masonry Latex Enamel, Flat.
 - c. Total DFT: 3.0 mils.
 - 2. Previously Painted Plaster (Interior):
 - a. Coat 1: Acrylic Latex Enamel, Semi-Gloss.
 - b. Coat 2: Acrylic Latex Enamel, Semi-Gloss.
 - c. Total DFT: 3.0 mils.
- F. Previously Painted Drywall:
 - 1. Coat 1: Acrylic Latex Enamel, Semi-Gloss, Stipple Roller Finish.
 - 2. Coat 2: Acrylic Latex Enamel, Semi-Gloss, Stipple Roller Finish.
 - 3. Total DFT: 3.0 mils.

END OF SECTION

PART 1 - GENERAL

1.01 REFERENCE

This list is part of Painting, Section 09 90 00.

PART 2 - PRODUCTS

2.01 MATERIALS GIVEN

Standard Materials and Finishes: Use pure unadulterated factory-mixed material delivered to site in unopened containers bearing manufacturer's name and brand; colors, as selected by Architect, shall be factory-mixed.

2.02 ACCEPTABLE MANUFACTURERS AND PRODUCTS

- A. General: All materials used the work shall be a proprietary brand of one of the manufacturers listed below for each type.

- B. Metal Primers:
 - 1. Zinc Dust:
 - a. Glidden; Glideguard Primer # 5229
 - 2. Rust-Inhibitive Primer for Ferrous Metals:
 - a. TNEMEC, Underwriters' Laboratories Fire Directory listing, Series 39K, PerimePrime Primer with spray-applied fire resistive material system (See Section 05120 and 07812).

- C. Sash and Trim - Water-Base Acrylic
 - 1. Dunn Edwards; Perma Sheen # W901-1
 - 2. Sherwin-Williams # A84W507
 - 3. Benjamin Moor # 096

- D. Exterior Masonry Finish:
 - 1. Dunn Edwards; Evershield # W 701-1; 100% acrylic
 - 2. Sherwin-Williams # A80W507
 - 3. Benjamin-Moore # 105

- E. Sealer; Latex:
 - 1. Dunn Edwards; Vinylastic Pigmented Wall Sealer W-101
 - 2. Sherwin-William # B28W101
 - 3. Benjamin Moore # 216

- F. Clear Floor Sealer Finish for Concrete Floors:

1. V-Seal.
 - a. Exterior Concrete:
 1. Sealer: Not Used.
 - b. Interior Concrete Floor Sealer: Provide the following system over concrete floors scheduled to receive sealer. This includes nominal colored concrete floors, stained concrete floors and integral color concrete floors.
 1. Over clean unstained concrete floor surface and provide V-Seal concrete sealers, Industra-Seal 117A - Concrete densifier and water-proofing, per manufacturer recommendations.
 2. Provide 1 coat of Industra-Coat # 3015, water based epoxy primer.
 3. Provide 1 coat of Industra-Coat # 3358 high solids high wear urethane.

All products above to be clear.

- G. Vinyl Acrylic Undercoater, Interior:
 1. Dunn Edwards; Acrylic Undercoater # W-101
 2. Sinclair; Acrylic Undercoater # 1770
- H. Enamel, Semi-Gloss Medium Orange Peel Stipple; Water-Base:
 1. Dunn Edwards; Perma Sheen # W901-1
 2. Sherwin-Williams # B9W41
 3. Benjamin Moore # 219
- I. Non-Slip Concrete Floor Coating: Concrete Non-Skid Coating, by ChemRex; or Acripoxy # 400, by Vista Paint.
- J. Exterior Concrete Masonry Unit Coating: Benjamin Moore and Co., M89 Waterproof Masonry Coating, or equivalent, with vinyl toluene butadiene resins.
 1. First Coat: M89 Waterproof Masonry Coating.
 2. Top Coat: Benjamin Moore and Co., MoorGlo 096, semi-gloss 100% acrylic paint, or equivalent.
- K. Urethane Coating, Interior Walls of Trash Enclosure and Can Wash Enclosure below 7'-0" (over smooth-troweled concrete plaster): Masonry units with concave tooled joints.
 1. First Coat Primer: Dunn Edwards BLOCFIL W305

2. Second and Third Coats: Dunn Edwards Monopole Permashield 100, 2 coats 4-6 mil thickness each coat, minimum.
- L. Sealed floor finish at interior of trash enclosure and can wash enclosure:
1. Two coats of solvent-base epoxy paint by International Protective Coats. 4-6 mil minimum thickness for each coat.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

Principal Work Items:

- A. Basketball Goals.
- B. Volleyball Standards.
- C. Tetherball Standard

1.02 RELATED WORK

- A. Requirements in Addenda, Alternates, General Conditions, and Division 1 Sections, collectively apply to this work.
- B. Section 03 30 00 - Cast-In-Place Concrete (Footings).

1.03 SUBMITTALS

Provide required submittals prior to installation in accordance with Section 01300 - Submittals.

- A. Shop Drawings: Indicating layout, details of construction, installation and anchorage.
- B. Product data: Duplicate Copies: Manufacturers standard brochures describing all materials, and installation instructions.

1.04 SUBSTITUTIONS

Only written approval of the Architect by Addenda or Change Order will permit substitutions for materials specified. Refer to Section 01 25 13 – Product Options and Substitutions for procedure.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

Delivery in factory protective packaging. Store and handle to prevent damage.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Single Goal Backstop (Exterior Basketball Courts): Porter Model No. 164 vertical outdoor backstop or approved equivalent.
 - 1. Face of backboard shall be 4'-0" extended from the centerline of the formed upright support.
 - 2. Upright Support: 4-1/2" O.D. heavy wall galvanized steel pipe formed to an appropriate 18" radius. Refer to drawings for required dimensions and footings.

3. Horizontal section shall have a slotted mounting plate to level the backboard and goal.
 4. Backboard: Porter No. 234, aluminum fan with 2" wide orange border and target area.
 5. Goal: Porter No. 00251-H00, double rim 5/8" diameter solid cold rolled steel bars, supported by 3/16" x 1" net tie strip. Rims shall be supported by heavy back plates with formed side plates. Goal shall be furnished with five carriage bolts and net. Field verify height.
- B. Double Goal Backstop (Exterior Basketball Courts): Porter Model No. 00186-140 or approved equivalent.
1. Face of backboard shall extend 6'-0" from face of upright support.
 2. Upright support: 5-9/16" O.D. heavy wall galvanized steel pipe. Refer to Drawings for locations for required dimensions and footings.
 3. Lower Horizontal Support Assembly: 3-1/2" O.D. heavy wall tubing equipped with special steel, die-formed fitting for attachment to upright support.
 4. Upper Horizontal and Diagonal Bracing: 1-7/8" O.D. steel tubes.
 5. Backboard: Same as single goal backstops.
 6. Goal: Same as single goal backstop.
- C. Outdoor Volleyball Net and Standards:
1. L.A. Steelcraft (800) 798-7401
 - a. Removable Post Set Model No. AGP-3, 3-1/2" O.D.
 - b. Removable Center Post Model No. AGP-3C, 3-1/2" O.D.
 - c. Finished: Galvanized finish.
 - d. "E" - Series Post Sleeves No. 350-E, set in concrete.
 - e. Netting: VB-1200, black netting with white binder and aircraft cable top and bottom.
 2. Volleyball sleeves to be installed after placement of adjacent concrete paving.
 3. Refer to Drawings for locations and required footings.
- D. Tetherball: L. A. Steelcraft Model No. TBPCB
1. Complete outfit including post, red foul marker, cap chain, swivel snap, ball and rope.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Layout: In accordance with manufacturers' approved shop drawings.
- B. Erect plumb, with surfaces aligned. Install all mounting accessories. Provide all necessary concrete footings.

SECTION 11 68 33
ATHLETIC FIELD EQUIPMENT

- C. Adjustment and Cleaning:
1. Adjustment: Repair or replace any damaged work.
 2. Cleaning: Wipe Surfaces clean in accordance with manufacturers' written instruction.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specifications Section, apply to this Section.
- B. Related Sections - the following Sections contain requirements that related to this Section:
 - 1. Section 02 30 00 - Subsurface Exploration.
 - 2. Section 31 22 13 - Rough Grading.
 - 3. Section 31 23 13 - Excavating, Backfilling, and Trenching.
 - 4. Section 32 12 16 - Asphaltic Concrete Paving.
 - 5. Section 32 13 13 - Portland Cement Concrete Paving.
 - 6. Section 33 00 00 - Site Utilities.
 - 7. Section 33 30 00 - Sewerage and Drainage for footings, underslab, and wall drainage.
 - 8. Section 03 30 00 - Cast-in-Place Concrete.
 - 9. Division 23 - Basic Mechanical Requirements.
 - 10. Division 26 - Basic Electrical Requirements.
- C. Geotechnical Engineering Report - Refer to Section 02 30 00.

1.02 DESCRIPTION OF SYSTEM

- A. The Contractor is solely responsible for determination of earthwork quantities.
- B. The Contractor shall, at his own expense, provide fill material not obtainable from site work area(s).
- C. If surplus soil is generated, the Contractor may spread it on-site in Architect designated and limited portions on the turfed playground area. It shall be placed as compacted fill in an even layer or layers with edges feathered at a 5% maximum slope to blend smoothly with adjacent grades.

1.03 SUMMARY

- A. This Section includes the following:
1. Preparing and grading subgrades for slabs-on-grade, walks, pavements, and landscaping.
 2. Excavating and backfilling for buildings and structures.
 3. Drainage and moisture control fill course for slabs-on-grade.
 4. Subbase course for walks and pavements.
 5. Excavating and backfilling trenches.
 6. Fill in over excavation.
 7. Rough and finish grading.

1.04 DEFINITIONS

- A. Excavation consists of the removal of material encountered to subgrade elevation and the reuse or disposal of materials removed.
- B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- C. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations.
- D. Subbase Course: The layer placed between the subgrade and base course in a paving system or the layer placed between the subgrade and surface of a pavement or walk.
- E. Base Course: The layer placed between the subbase and surface pavement in a paving system.
- F. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Architect. Unauthorized excavation, as well as remedial work directed by the Architect, shall be at the Contractor's expense.
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.

- H. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.

1.05 SUBMITTALS

- A. Section 01 33 00 - Submittals.
- B. Product data for each type of plastic warning tape.
- C. Samples of the following:
 - 1. 20 pound (9 kg) samples tested in air-tight containers, of each proposed fill and backfill soil material from on-site or borrowed sources.
- D. Test Reports: In addition to test reports required under field quality control, submit the following:
 - 1. Laboratory analysis of each soil material proposed for fill and backfill from on-site or borrowed sources.
 - 2. One optimum moisture-maximum density curve for each soil material.
 - 3. Report of actual unconfined compressive strength and/or results of bearing tests of each stratum tested.
- E. Photographs of existing adjacent structures and site improvements.

1.06 QUALITY ASSURANCE

- A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.
- B. Requirements of Regulatory Agencies:
 - 1. Codes: Conform to Title 24, CCR; and CBC, 2010 Edition; and State of California Safety Regulations.
 - 2. Off-Site Work:
 - a. Conform to Local Governing Agency requirements.
 - b. Obtain and pay for permits, licenses, and fees.
 - c. Arrange for tests and inspections.

- C. Testing and Inspection Services: Owner will employ a qualified independent geotechnical engineering testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing.
- D. Testing Agency:
 - 1. On-Site Work: District designated Soils Engineer.
 - 2. Off-Site Work: Governing Agency approved testing laboratory.
- E. Preinstallation Conference: Conduct conference at project site per Owner Construction Manager requirements. Before commencing earthwork, meet with representatives of the governing authorities, Owner, Architect, consultants, Geotechnical Engineer, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

1.07 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the Owner or others except with permitted in writing by the Architect and then only after acceptable temporary utilities have been provided. Provide a minimum 48 hours notice to the Architect and receive written notice to proceed before interrupting any utility.
- B. Environmental Requirements: Provide de-watering and drainage as required to accomplish this work. Discharge water at approved locations.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.

- B. Satisfactory Soil Materials: ASTM D2487 soil classification groups, GW, GP, GM, SW, SP, and SM; free of rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soil Materials: ASTM D2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.
- D. Backfill and Fill Materials: Satisfactory soil materials.
- E. Subbase and Base Material: Naturally or artificially graded mixture or natural or crushed gravel, crushed stone, and natural or crushed sand, ASTM D2940, with at least 95% passing a 1-1/2" sieve and not more than 8 and passing a No. 200 sieve.
- F. Engineered Fill: Subbase or base material.
- G. Bedding Material: Subbase or base materials with 100% passing a 1" sieve and not more than 8" passing a No. 200 sieve.
- H. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D448, coarse aggregate grading size 57, with 100% passing a 1-1/2" sieve and not more than 5% passing a No. 8 sieve.
- I. Filtering Material: Evenly graded mixture of natural or crushed gravel or crushed stone and natural sand with 100% passing a 1-1/2" sieve and 0% to 5% passing a No. 50 sieve.
- J. Impervious Fill: Clay gravel and sand mixture capable of compacting to a dense state.
- K. Topsoil: Sand top material with 100% passing 1" sieve.
- L. Concrete: Structural concrete with a compressive strength of 2,500 psi for fill to correct unauthorized excavation.

2.02 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6" wide and 4 mils thick minimum, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30" deep.
 - 1. Tape Colors: Provide tape colors to utilities as follows:
 - a. Red: Electric
 - b. Yellow: Gas, oil, steam, and dangerous materials.
 - c. Orange: Telephone and other communications.
 - d. Blue: Water systems.
 - e. Green: Sewer systems.

PART 3 - EXECUTION

3.01 PREPARATION (Refer to Section 31 00 00, 1.01C)

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Field Measurements: Verify that benchmark and intended elevations for the work are shown on the drawings.
- C. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.02 DEWATERING

- A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

3.03 EXCAVATION

- A. General:
 - 1. Grade, cut excavate, fill, and compact work areas.
 - 2. Fill local holes and depressions.
 - 3. Shape grades to drain water away from buildings, maintain flow lines, to prevent ponding of water.

3.04 STABILITY OF EXCAVATIONS

- A. Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.
- B. Design Criteria; Bracing and Shoring:
 - 1. The Contractor shall be solely responsible for design, construction, and maintenance of bracing and shoring to safely support loads.
 - 2. Temporary uncharged excavations may be sloped at 1:1 ratio; permanent slopes shall not exceed 2:1 ratio when authorized by the Architect. In general, permanent slopes shall not exceed 3:1 ratio.

3.05 EXCAVATION FOR STRUCTURES

- A. Coordinate all work with Section 02 30 00 - Subsurface Exploration, copy of which is available at Construction Manager's office.
- B. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1.2" (30 mm). Extend excavations a sufficient distance from structures for placing and removing concrete formwork, installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 - 2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Appurtenances: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1.2" (30 mm). Do not disturb bottom of excavations intended for bearing surface.
 - 3. Excavate subsoil required to accommodate building foundation and site structures.

4. Excavate a minimum 6" into formational material and to requirements on foundation plans for all buildings and pavilions.

3.06 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.
- B. Scarify subgrade under walks and pavements to a depth of 8", moisture condition to optimum moisture content and recompact.

3.07 EXCAVATION FOR UTILITY TRENCHES (Refer to Section 31 00 00, 1.01, C)

- A. Excavate trenches to indicated slopes, lines, depths, and invert elevations.
- B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12" (300 mm) higher than top of pipe or conduit, unless otherwise indicated.
 1. Clearance: 8" (300 mm) each side of pipe or conduit.
 2. Clearance: As indicated
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove stones and sharp objects to avoid point loading.
 1. For pipes or conduit less than 6" (150 mm) in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 2. For pipes and conduit 6" (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90° of pipe circumference. Fill depressions with tamped sand backfill.
 3. Where encountering rock or another unyielding bearing surface, carry trench excavation 6" (150 mm) below invert elevation to receive bedding course.
 4. Utility trenching cut shall not interfere with critical bearing angle of foundations.

3.08 APPROVAL OF SUBGRADE

- A. Notify Architect when excavations have reached required subgrade.
- B. When it is determined that unforeseen unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.
- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Architect.

3.09 UNAUTHORIZED EXCAVATION (Refer to Section 31 00 00 1.01, C)

- A. Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the Architect. Fill unauthorized excavations under other construction as directed by the Architect.
- B. Where indicated widths of utility trenches are exceeded, provide stronger pipe, or special installation procedures, as required by the Architect.

3.10 STORAGE OF SOIL MATERIALS

Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent wind-blown dust. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

- A. Backfill excavations promptly, but not before completing the following:
 - 1. Acceptance of construction below finish grade including, where applicable, damp proofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for record documents.

3. Testing, inspecting, and approval of underground utilities.
4. Concrete from work removal.
5. Removal of trash and debris from excavation.
6. Removal of temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.12 UTILITY TRENCH BACKFILL

- A. Place and compact bedding course on rock and other unyielding bearing surfaces and to fill unauthorized excavations. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- B. Concrete backfill trenches that carry below or pass under footings and that are excavated within 18" (450 mm) of footings. Place concrete to level of bottom of footings.
- C. Provide 4" (100 mm) thick concrete base slab support for piping or conduit less than 30" (750 mm) below surface of roadways. After installation and testing, completely encase piping or conduit in a minimum of 4" (100 mm) of minimum 2,000 psi concrete before backfilling or placing roadway subbase.
- D. Place and compact initial backfill of satisfactory soil material or subbase material, free of particles larger than 1" (25 mm), to a height of 12" (300 mm) over the utility pipe or conduit. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system.
- E. Coordinate backfilling with utilities testing.
- F. Fill voids with approved backfill materials as shoring and bracing, and sheeting are removed.
- G. Place and compact final backfill of satisfactory soil material to final subgrade.

- H. Install detectable warning tape directly above utilities, 12" (300 mm) below finished grade, except 6" (150 mm) below subgrade under pavements and slabs.

3.13 PLACING TOPSOIL

- A. Subgrade to a depth of 6" prior to placing topsoil.
- B. Place topsoil in turf areas and planter areas around and between buildings not indicated as paving.
- C. Fine grade topsoil at eliminated rough or low areas. Maintain levels, profiles, and contours of subgrade.
- D. Remove stones in excess of 1", roots, grass, weeds, debris, and foreign material while spreading.
- E. Lightly compact placed topsoil.
- F. Place 12" thickness of compacted topsoil at all planting areas.

3.14 FILL

- A. Preparation: Remove vegetation, topsoil, debris, wet and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing fills. Plow strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing surface.
- B. When subgrade or existing ground surface to receive fill has a density less than that required for fill, break up ground surface to depth required, pulverize, moisture-condition or aerate soil and recompact to required density.
- C. Place fill material in layers to required elevations for each location listed below.
 - 1. Under grass, use satisfactory excavated or borrowed soil material.
 - 2. Under walks and pavements, use subbase or base material, or satisfactory excavated or borrowed soil material.

3.15 MOISTURE CONTROL (Refer to Section 31 00 00 1.01, C)

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2% of optimum moisture content.
 - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air-dry satisfactory soil material that is too wet to compact to specified density. Stockpile or spread and dry removed wet satisfactory soil material.

3.16 COMPACTION (Refer to Section 31 00 00 1.01, C)

- A. Place backfill and fill materials in layers not more than 8" (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4" (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Compaction, General:
 - 1. Compact work area, whether cut or fill, to required densities.
 - 2. Densities shall be stated percentages of the maximum dry soil densities as measured by ASTM Test Method D1557.
 - 3. Do not place additional lifts over a previous lift which has not been compacted to the required dry density, or when soil conditions are unstable.
 - 4. Preparation: Clear the area.
 - 5. Scarification:
 - a. Scarify next 6" of exposed soils. Scarification shall continue until soils are broken down and free of large lumps or clods, and the working surface is reasonably uniform and free of features which would inhibit compaction.
 - b. Bring to 2% to 4% above optimum moisture content.
 - 6. Excavating/Cutting: Where cutting is indicated, excavate to a plane 1' below final earth subgrade, unless otherwise specified.
 - 7. Compacted Soils:
 - a. Soils: Use site soils and import soils.
 - b. Place in successive 6" thick layers. Spread each layer evenly and mix thoroughly during spreading to attain uniformity of material and moisture in each layer.

- c. Bring existing clay site soils to 2% to 4% above optimum moisture content. Bring any import soils to optimum moisture content +2%.
 - d. Compact each layer, as required, using mechanical vibrating plate temper.
 - e. Bring to proper subgrade.
8. Field Quality Control: Test at Owner's option.
- C. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density according to ASTM D1557:
1. Under structures, building slabs, steps, and pavements, compact the top 12" (300 mm) below subgrade and each layer of backfill or fill material at 95% maximum dry density.
 2. Under walkways, compact the top 6" (150 mm) below subgrade and each layer of backfill or fill material at 95% maximum dry density.
 3. Under lawn or unpaved areas, compact the top 6" (150 mm) below subgrade and each layer of backfill or fill material at 90% maximum dry density.

3.17 ADJUSTMENT AND CLEANING

- A. Adjustment:
1. Over-Excavation: Remedy at Contractor's expense.
 - a. Fill and recompact to proper level.
 2. Repair damaged subgrades or other work.
 3. Adjust and rework as necessary until compaction and the Contract Document requirements are met.
- B. Protection: Protect finished work from damage by traffic or continued use.
- C. Cleaning: Work areas to be free of debris, weeds, and excess earth.

3.18 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between existing adjacent grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.
- B. Finish Grading: Finish grades as required to provide contours and elevations as indicated.

3.19 FIELD QUALITY CONTROL

- A. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.
1. Perform field in-place density tests according to ASTM D1556 (sand cone method), ASTM D2167 (rubber balloon method), or ASTM D2937 (drive cylinder method), as applicable.
 - a. Field in-place density tests may also be performed by the nuclear method according to ASTM D2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D3017.
 - b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Architect.
 2. Footing Subgrade: At footing subgrades, perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of each subgrade with related tested strata when acceptable to the Architect.
 3. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
 4. Foundation Wall Backfill: In each compacted backfill layer, perform at least one field in-place density test for each 100' (30 m) or less of wall length, but no fewer than two tests along a wall face.

5. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in-place density test for each 150' (45 m) or less of trench, but no fewer than two tests.
- B. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact and retest until required density is obtained.

3.20 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property.
- B. Transport surplus satisfactory soil to designated storage areas on the Owner's property. Stockpile or spread soil as directed by Architect. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property.

3.21 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions. Scarify or remove and replace material to depth directed by the Architect; reshape and recompact at optimum moisture content to the required density.
- C. Settling: Where settling occurs during the Project correction period, test for proper compaction and materials, remove non-complying materials including surfacing. Backfill with additional approved material, compact, and reconstruct surfacing. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the following:
 - 1. Protecting existing trees and vegetation to remain.
 - 2. Removing trees and other vegetation.
 - 3. Clearing and grubbing.
 - 4. Topsoil stripping and stockpiling.
 - 5. Removing above-grade site improvements.
 - 6. Disconnecting, capping or sealing, and abandoning site utilities in place.
 - 7. Disconnecting, capping or sealing, and removing site utilities.

1.02 RELATED DOCUMENTS

- A. Drawings and general provision of the Contract, including Addenda, Alternates, General and Supplementary Conditions and Division 1 Specification Sections, collectively, apply to this work.
- B. Section 01 50 00 - Construction Facilities and Temporary Controls for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and environmental protection measures during site operations.
- C. Section 02 41 16 Building Demolition for demolition of buildings, structure, and site improvement.
- D. Section 31 00 00 - Earthwork for soil materials, excavating, backfilling, and site grading.

1.03 DEFINITIONS

Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2" (50 mm) in diameter; and free of weeds, roots, and other deleterious materials.

1.04 MATERIALS OWNERSHIP

Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

1.05 SUBMITTALS

- A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.
- B. Record drawings according to Section 01 77 00 - Project Closeout. Identify and accurately locate capped utilities and other subsurface structural, electrical, and mechanical conditions.
- C. Two (2) copies of permits and notices.

1.06 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Construction Conferences.
- B. Source Quality Control: All demolition work conducted under this section shall be done by the same subcontractor for all demolition work on this project.
- C. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this project.
- D. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- E. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved program.

1.07 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
 - 3. Maintain egress and ingress for site traffic at all times.

- B. Improvements on Adjoining Property: Authority for performing indicated removal and alteration work on property adjoining Owner's property will be obtained by owner before award of Contract.
- C. Storage or sale of items scheduled for removal is not permitted.
- D. Arrange for work to be scheduled so as to not interfere with Owner's on-site operations.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Section 31 00 00 - Earthwork. Obtain approved borrow soil materials off-site when satisfactory soil materials are no available on-site.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Locate and clearly flag trees and vegetation to remain or to be relocated.
- D. Protect existing landscape and site improvements scheduled to remain from damage during construction. Restore damaged improvements to their original condition, as acceptable to Owner.
- E. Contractor shall contact the local service alert company for information on buried utilities and pipelines prior to commencement of site clearing.
- F. Conduct demolition to minimize interference with adjacent structures, trees, and properties.
- G. Provide, erect, and maintain temporary barriers and security devices.

3.02 TREE PROTECTION

- A. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.
 - 1. Do not store construction materials, debris, or excavated material within drip line of remaining trees.
 - 2. Do not permit vehicles, equipment, or foot traffic within drip line of remaining trees.

- B. Do not excavate within drip line of trees, unless otherwise indicated.

- C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
 - 1. Cover exposed roots with burlap and water regularly.
 - 2. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.
 - 3. Coat cut faces of roots more than 1-1/2" (38 mm) in diameter with emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
 - 4. Cover exposed roots with wet burlap to prevent roots from drying out. Backfill with soil as soon as possible.
 - 5. Water trees and other vegetation to remain within limits of contract work as required to maintain their health during course of construction progress.

- D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.
 - 1. Employ a qualified arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
 - 2. Replace trees that cannot be repaired and restored to full-growth status, as determined by the qualified arborist.

3.03 UTILITIES

- A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed or abandoned. Owner will arrange to shut off indicated utilities when requested by Contractor.

- B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Architect's written permission.
- C. Excavate for and remove underground utilities indicated to be removed.

3.04 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
 - 3. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18" (450 mm) below exposed subgrade.
 - 4. Use only hand methods for grubbing within drip line of remaining trees.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated. Place fill material in horizontal layers not exceeding 8" (200 mm) loose depth, and compact each layer to a density equal to adjacent original ground.

3.05 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping soil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other waste materials.

- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Limit height of topsoil stockpiles to 72" (1800 mm).
 - 2. Do not stockpile topsoil within drip line of remaining trees.
 - 3. Dispose of excess topsoil as specified for waste material disposal.
 - 4. Stockpile surplus topsoil and allow for respreading deeper topsoil.

3.06 SITE IMPROVEMENTS

- A. Remove existing above and below grade improvements in conjunction with Building Demolition - Section 02 41 16, as indicated and as necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavements. Saw-cut faces vertically.
- C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

3.07 DISPOSAL

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property. Do not allow materials and/or debris to accumulate on site.
- B. Burning of materials and debris is not permitted on Owner's property.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. Remove topsoil and stockpile for later reuse.
- B. Excavate subsoil and stockpile for later reuse.
- C. Grade and rough contour site.

1.02 RELATED WORK

- A. Section 02 41 19.13 - Selective Demolition.
- B. Section 31 00 00 - Earthwork.
- C. Section 31 23 31 - Excavating, Backfilling and Trenching.
- D. Section 32 12 16 - Asphaltic Concrete Paving.
- E. Section 32 13 13 - Portland Cement Concrete Paving
- F. Section 33 00 00 - Site Utilities.
- G. Section 33 31 00 - Sewerage and Drainage.

1.03 PROJECT RECORD DOCUMENTS

- A. Submit documents under provisions of Section 01 77 00.
- B. Accurately record location of utilities remaining, rerouted utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

1.04 PROTECTION

- A. Protect trees, shrubs, lawns, and other features remaining as portion of final landscaping.
- B. Protect bench marks, existing structures, fences, roads, sidewalks, and paving and curbs designated to remain.

- C. Protect above or below grade utilities which are to remain.
- D. Repair damage to any items designated to remain or outside of the project areas, whether owned by the District or not.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Topsoil: Excavated organic soil material, graded free of roots, rocks larger than one inch, subsoil, debris, and large weeds.
- B. Subsoil: Excavated material, graded free of lumps larger than 4 inches, rocks larger than 2-1/2", and debris.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Identify known below grade utilities. Stake and flag locations.
- C. Identify and flag above grade utilities.
- D. Maintain and protect existing utilities remaining which pass through work area.
- E. Notify utility company to remove and relocate utilities.
- F. Upon discovery of unknown utility or concealed conditions, discontinue affected work; notify Architect/Engineer.

3.02 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, relandscaped, or regraded and stockpile in area designated on site.
- B. Do not excavate wet topsoil.

- C. Stockpile topsoil to depth not exceeding 8 feet. Cover to protect from erosion.

3.03 SUBSOIL EXCAVATION

- A. Excavate subsoil from marked areas and stockpile in area designated on site.
- B. Do not excavate wet subsoil.
- C. Stockpile subsoil to depth not exceeding 8'.
- D. When excavation through roots is necessary, perform work by hand and cut roots with a sharp axe.

3.04 TOLERANCES

Top Surface of Subgrade: Plus or minus one inch.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. Excavating, backfilling, and compacting for utility pipes, water, irrigation lines sewer lines, storm drain lines, manholes, vaults, valve boxes, catch basins, underground tanks, thrust blocks, yard boxes, pull boxes and electrical conduits as required.
- B. Compacting bedding under fill over utilities to subgrade elevations.
- C. Related Work:
 - 1. Subsurface Exploration: Section 02 30 00.
 - 2. Earthwork: Section 31 00 00; other compacting requirements.
 - 3. Piped Utilities: Section 33 40 00.
 - 4. Sewerage and Drainage: Section 33 31 00.
 - 5. Basic Mechanical Requirements: Division 23.
 - 6. Basic Electrical Requirements: Division 26.

1.02 SOILS INFORMATION

- A. Information on the Drawings or in the soil investigation reports does not constitute a guarantee of uniformity of soil conditions over the construction site.
- B. A copy of the foundation investigation and soils report included herein is for reference only.

1.03 FIELD MEASUREMENTS

Verify that survey benchmark and intended elevations for the Work are as shown on Drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Use fill materials free of foreign materials, vegetable growths, sod, expansive soils, and all debris.

- B. Fill Material:
 - 1. If the amount of suitable earth materials obtained from the Site excavations is not sufficient to properly construct the refill, furnish imported fill materials as necessary.
 - 2. Imported fill shall be of a granular nature with sufficient binder to form a firm and stable unyielding subgrade and shall not have more than 60% of fines passing a 200 mesh sieve. Material shall have a coefficient of expansion of not more than 2% from air-dry to optimum moisture content and not more than 6% from air-dry to saturation.

- C. Backfill Materials: Use clean earth materials previously removed from excavations or imported fill material as specified above, free from large clods and stones larger than 2-1/2".

2.02 BASE MATERIALS

- A. Under Concrete Slabs On Grade: Where indicated on the Drawings, use 3/4" maximum size crushed aggregate base.

- B. Under Asphaltic Concrete Paving: As indicated on the Drawings and specified as Base Course in Section 32 12 16.

- C. Under Portland Cement Concrete Paving: As indicated on the Drawings and specified as Base Course in Subsurface Exploration Section 02 30 00.

- D. Bedding:
 - 1. Sand Bedding: Clean fine-grained sand of such size that not less than 90% shall pass through a 1/4" screen and not more than 25% shall pass through a number 50 screen. Sand meeting specifications for fine aggregate for concrete may be used.

PART 3 - EXECUTION

3.01 EXAMINATION

Field conditions may require deviations from information indicated on Drawings, or recommendations made in Soils Report. Such changes in the Work, shall be covered by a Change Order, indicating an increase or decrease in the Contract sum.

3.02 PREPARATION

- A. Trenches, ditches, pits, sumps, and similar items which are outside the barricaded working area shall be barricaded to conform to California OSHA standards.
- B. Protect plant life, lawns, rock outcroppings and other features to remain.
- C. Perform Work in such a manner and at such times as not to interrupt the satisfactory performance of the existing services to the buildings on the site used by the District. Where an interruption is necessary, obtain written approval from the District.

3.03 EXCAVATION

- A. Trenches over 5' in depth shall conform to Construction Safety Orders of the California Division of Industrial Safety.
- B. Excavate trenches parallel to footings no closer than 24" from the face of the footing or above a plane having a downward slope of two horizontal to one vertical, from a line 9" above the bottom of the footings.
- C. Unless otherwise indicated on the Drawings, depth of excavations shall allow for a minimum coverage above the top of pipe, or conduit measured from the adjoining finished grade, as follows:
 - 1. Steel Pipe: 24" below finished grade.
 - 2. Copper Water Tube: 18" below finished grade.
 - 3. Cast-Iron, Pressure Pipe: 36" below finished grade.
 - 4. Plastic Pipe (other than waste): 30" below finished grade.
 - 5. Tanks or other structures: 36" below finished grade.
 - 6. Soil, sewer and storm drain: As required for proper pitch. (Install plastic pipe with not less than 18" coverage.)
- D. Trench width shall provide ample space for working and joining. Dig holes for bells for bell and spigot pipe, and for fittings for pipe.

SECTION 31 23 13
EXCAVATING, BACKFILLING AND TRENCHING

- E. Excavate trenches for utilities, pipes, concrete encased electrical conduits and fuel tanks to required depth as indicated on Drawings. Grade bottom of trenches to a uniform surface to prevent pockets. Remove loose soil from excavation before placing 6" of 90% compacted sand bedding. Place pipes, conduits and other utilities on a uniformly bearing sand bed.
- F. Keep excavation free of water during the installation Work. Dispose of water in such a manner as not to endanger public or private property or public health. Remove accumulated water in excavations by pumping or other approved means.
- G. Where portions of existing structures, walks, and paving are removed or cut for pipe or conduit installation, replace with equal quality material, finished to match adjacent work.
- H. Provide a minimum space of 2" between outer surfaces of buried pipes including conduits placed in the same trench.

3.04 BACKFILLING

- A. Backfill excess excavations to the required level with earth, gravel, sand, or concrete as directed by the Engineer and compact thoroughly. Grade the ground adjacent to all excavations to prevent water from running in.
- B. Pipe to be laid lengthwise under concrete walks must have the approval of the Inspector of Record (IOR).
- C. Do not place backfill until the Work installed has been inspected, tested and approved by the IOR. Remove excavated rocky material unsuitable for backfill from the Site.
- D. Place backfill in 6" thick, loose layers, bring to near optimum moisture and compact to 90% minimum.
- E. Trenches for electrical installation outside of the barricaded working area, shall be backfilled within 72 hours after approval by the District Electrical Inspector.

SECTION 31 23 13
EXCAVATING, BACKFILLING AND TRENCHING

- F. Trenches or other excavations that extend more than 4' below the surface shall comply with Public Contract Code Section 7104.

3.05 INSPECTION AND TESTING

- A. The IOR will inspect subgrades and excavation prior to the placing of fill materials.
- B. Make compaction test in accordance with ASTM D1557, method "C".

3.06 EXCESS MATERIAL DISPOSAL

Remove excess excavated and imported material not used for fill or backfill and waste and debris from the Site.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY OF WORK

- A. Repair/patching existing pavement.
- B. Fill all cracks in existing paving.
- C. Surface sealer coats.

1.02 RELATED WORK

- A. Section 32 12 36.14 - Asphalt Pavement Crack Filler and Seal Coats.
- B. Section 32 17 23.13 - Pavement Marking.

1.03 REFERENCES

- A. California Department of Transportation (CALTRANS), Division of Highways Standard Specifications, as last amended.
- B. Definitions: Paving and base Type designations.
 - 1. Type A: Areas taking automobile traffic.
 - 2. Type B: Areas taking bus and/or truck traffic and fire lanes.
 - 3. Type C: Areas taking pedestrian traffic (hard-court/play areas).
 - 4. Type E: Areas where paving is to be replaced. Refer to 3.03.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with CALTRANS Standard Specifications.
- B. Off-site work to conform to local governing agency requirements. Obtain and pay for required permits and licenses. Do required testing.
- C. Allowable Tolerances:
 - 1. Material Weights: Weights of base course and paving materials delivered to Site shall be computed as follows:
 - a. Asphalt Concrete Paving: 12 lbs/sf/inch of thickness.
 - b. Rock Base Course: 9-1/2 lbs/sf/inch of thickness.
 - 2. Paving Surface Smoothness: 3/8" maximum permissible from a true plane measured from 10' straight edge placed on surface non-cumulative.

1.05 SUBMITTALS

- A. Submit product data.
- B. Submit test reports of field quality control tests.
- C. Submit Weighmaster's Certificates showing net weight of each load of base and paving materials.

SECTION 32 12 16.09
 ASPHALTIC CONCRETE PAVING
 REPAIR, CRACK FILLER AND SEAL COATS

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Place asphalt when base surface temperature is above 40°F and dry, and when weather is stable.
- B. Do not commence work until installation of underground pipes and utilities is complete.

1.07 GUARANTEE

- A. In addition to guarantee specified in Contract Close-Out, Section 01700, the Contractor shall repair or restore to first class condition any portion of asphaltic paving and surface coating in which weed growth, creeping, shoving, cracking, delamination, raveling, softening, excessive or uneven settlement due to improperly compacted subgrade, or other defects due to improper placing or defective materials, become apparent within one (1) year from acceptance date by the District.
- B. Effectiveness of type of weed control is sole responsibility of the Contractor.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Weed Control:
 - 1. Herbicide: Only use of borates, sodium chlorate, or other nonpoisonous chemicals will be permitted.
 - 2. Option: The Contractor may, at his option and expense, use Nox-Weed 310 emulsion.
- B. Base Course: Untreated rock using a pit run unwashed stream bar material, crusher run material, or blend of commercial products; graded as follows:
 - 1. Class 2 Aggregate Base, per Section 26, CALTRANS Standard Specifications.
 - 2. Mixing: Thoroughly blend material by blading or other suitable means.
- C. Asphalt Concrete Paving:
 - 1. General: CALTRANS Standard Specifications, except as modified herein.
 - 2. Asphalt: 40 or 50 penetration.
 - 3. Aggregate: Graded mix as follows:

TOTAL PERCENTAGE PASSING SIEVES

<u>Sieve Size</u>	<u>Percentage</u>	
3/4"	100%	
1/2"	90%-100%	
3/8"	74%-89%	
No. 4	53%-67%	
No. 8	40%-50%	
No. 30	20%-30%	
No. 200	3%-8%	
Paving Asphalt	5-1/2 % to 7%	by weight of total mix.

SECTION 32 12 16.09
ASPHALTIC CONCRETE PAVING
REPAIR, CRACK FILLER AND SEAL COATS

4. Mixing: Plant mix aggregate and asphalt, to produce a dense mixture with minimum of voids, per Section 39, CALTRANS Standard Specifications.
- D. Surface Seal Coat For All Paving Areas:
1. Meet Green Book, Specification No. 203-9-Seal Coat Asphalt Base.
 2. Sealer shall be Over Kote Asphalt Pavement Coating by Reed & Graham, Inc. or approved equal.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify existing paving is dry and ready to support paving and imposed loads.
- B. Beginning of installation means acceptance of existing surface and conditions.

3.02 REPAIR EXISTING CRACKS:

- A. Less than 1/4": Fill with Over Kote, Crack Filler by Reed & Graham, Inc. or approved equal.
- B. Greater than 1/4" but less than 1/2": Fill with Over Kote, Crack Filler II by Reed & Graham, Inc. or approved equal.
- C. Greater than 1/2" but less than 1": Remove asphalt a minimum of 2" down or to sound pavement and re-pack area with asphalt paving mix following procedures under Paragraph 3.03.
- D. Greater than 1": Follow procedures under Paragraph 3.03.

3.03 REPAIR/PATCHING EXISTING PAVEMENT

- A. Remove any heaving, defective pavement and existing deteriorated in areas defined and all pavement disturbed by construction activity to minimum 6" in depth or until sound subgrade is obtained. Extend limits minimum 12" wide into sound pavement; make cuts in straight lines.
- B. Contractor to remove spoils from site and dispose of properly.
- C. Apply tack coat to sides and bottom of excavated areas.
- D. Place asphaltic concrete in maximum 4" high lifts thoroughly and evenly compact using equipment which will obtain maximum compaction without damage to surrounding pavement.
- E. Contour and blend patches to lines and elevations of adjacent surfaces.
- F. Determine location of "bird baths". Apply tack coat and blend new leveling asphalt to existing surface.

- G. Apply 2 applications of seal coat 2 days apart over entire surface and re-stripe.

3.04 APPLICATION - SURFACE SEAL

- A. Refer to Specification Section 32 12 36.14, Asphalt Pavement Crack Filler and Seal Coat.
- B. Preparation:
1. Clean paving surface removing all loose, foreign materials.
 2. Contractor shall exercise one of the following procedures:
 - a. Remove existing concrete parking bumpers prior to seal coat application and replace all bumpers on the original manner after curing period.
 - b. Mask all bumpers completely to prevent seal coat from splashing onto bumpers.
 3. Preventive measures shall be taken to protect existing concrete surfaces including curbs, walks, light pole mounting piers, etc, from over-splash by seal coat.
- C. Application:
1. Per manufacturer's recommendations.
 2. Mix into a slurry with three to six lbs. of sand per gallon of sealer.
 3. Protect adjacent structures from mixture.
 4. **Apply evenly in two coats.** Spread immediately with rubber-faced squeegees; pull at angle from line of spread, to roll material toward operator. After each coat has dried, remove ridges with scraper.
 5. Total Application Rate for Two Coats: Apply at an undiluted rate of 0.2 gallons minimum per square yard. Increase application rate due to surface porosity per manufacturer's printed recommendations.
- D. Protect from traffic for three (3) days minimum after application.

3.05 FIELD QUALITY CONTROL

- A. On-Site Work:
1. Water Test: Flood test paving to show surfaces are free of standing puddles, and drain properly.
 2. Material Tests:
 - a. Made at District's option, by District selected Testing Lab.
 - b. District's Inspector to select test sample locations.
 - c. The Contractor is to repair test areas at no additional cost to District.
 - d. Testing costs by Contractor.

3.06 CLEANING

Remove equipment, excess materials, debris, and material splashes from abutting work.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. Asphaltic concrete paving.
- B. Surface sealer (Seal coat).
- C. Weed control.

1.02 RELATED WORK

- A. Requirements in Addenda, Alternates, Conditions, and Division 1 collectively apply to this work.
- B. Section 31 00 00 - Earthwork.
- C. Section 31 22 13 - Rough Grading: Preparation of site for paving.
- D. Section 31 23 13 - Excavating, Backfilling, and Trenching: Compacted fill for paving.
- E. Section 32 12 36.13 - Asphalt Pavement Slurry Seal (Top, final coat).
- F. Section 32 17 23 - Pavement Marking.
- G. Section 32 17 13 - Parking Bumpers.

1.03 REFERENCES

- A. California Department of Transportation (CALTRANS), Division of Highways-Standard Specifications, as last amended.
- B. Definitions: Paving and base Type designations.
 - 1. Type A: Areas taking automobile traffic.
 - 2. Type B: Areas taking bus and/or truck traffic.
 - 3. Type C: Areas taking pedestrian traffic (play areas).

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with CALTRANS Standard Specifications.

- B. Off-site work to conform to local governing agency requirements. Obtain and pay for required permits and licenses. Do required testing.
- C. Allowable Tolerances:
 - 1. Material Weights: Weights of base course and paving materials delivered to Site shall be computed as follows:
 - a. Asphalt Concrete Paving: 12 lbs/sf/inch of thickness.
 - b. Rock Base Course: 9-1/2 lbs/sf/inch of thickness.
 - 2. Paving Surface Smoothness: 3/8" maximum permissible from a true plane measured from 10' straightedge placed on surface non-cumulative.

1.05 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.
- B. Submit test reports of field quality control tests.
- C. Submit Weighmaster's Certificates showing net weight of each load of base and paving materials.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Place asphalt when base surface temperature is above 40°F and dry, and when weather is stable.
- B. Do not commence work until installation of underground pipes and utilities is complete.

1.07 ALTERNATIVES

- A. Contractor's Option For Full-Thickness Paving: In lieu of providing rock base course, Contractor may, at his option and expense, install thickened paving section directly on compacted earth on the following basis:
 - 1. Substitute 1" of additional paving thickness for each 2" of specified base course thickness omitted.

1.08 GUARANTEE

- A. In addition to guarantee specified in Project Close-Out, Section 01 77 00, the Contractor shall repair or restore to first class condition any portion of asphaltic paving and surface coating in which weed growth, creeping, shoving, cracking, delamination, raveling, softening, excessive or uneven settlement due to improperly compacted subgrade, or other defects due to improper placing or defective materials, become apparent within one (1) year from acceptance date by the District.
- B. Effectiveness of type of weed control is sole responsibility of the Contractor.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Weed Control:
 - 1. Herbicide: Only use of borates, sodium chlorate, or other nonpoisonous chemicals will be permitted.
 - 2. Option: The Contractor may, at his option and expense, use Nox-Weed 310 emulsion.
- B. Base Course: Untreated rock using a pit run unwashed stream bar material, crusher run material, or blend of commercial products; graded as follows:
 - 1. Class 2 Aggregate Base, per Section 26, CALTRANS Standard Specifications.
 - 2. Mixing: Thoroughly blend material by blading or other suitable means.
- C. Asphalt Concrete Paving:
 - 1. General: CALTRANS Standard Specification, except as modified herein.
 - 2. Asphalt: 40 or 50 penetration.
 - 3. Aggregate: Graded mix as follows:

TOTAL PERCENTAGE PASSING SIEVES

<u>Sieve Size</u>	<u>Percentage</u>
3/4"	100%
1/2"	90%-100%
3/8"	74%-89%
No. 4	53%-67%
No. 8	40%-50%
No. 30	20%-30%
No. 200	3%-8%
Paving Asphalt	5-1/2 % to 7% by weight of total mix.

4. Mixing: Plant mix aggregate and asphalt, to produce a dense mixture with minimum of voids, per Section 39, CALTRANS Standard Specifications.

D. Surface Seal Coat For All Paving Areas:

1. Sealer: Plushtex by Koch Asphalt Co., Fontana, CA, telephone 909-829-0505, as a standard of quality: An asphalt emulsion with selected mineral fillers.
2. Sand: Clean, washed sand, 30 to 60 mesh.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify compacted subgrade is dry and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. Beginning of installation means acceptance of substrate.

3.02 PREPARATION

- A. Subgrade Preparation: After areas are brought to approximate required subgrade, finish by scarifying to depth of 12", moistening and rolling with a self-propelled tandem roller, weighting 8 tons minimum, until surface is firm and unyielding. Bring any depressions and high areas to required grade by scarifying, filling or cutting, and rolling to density and stability of adjoining material.

- B. Weed Control: Just prior to paving work, apply herbicide to earth as per manufacturer's printed recommendations.
- C. Coat surfaces of manhole, catch basin, and metal surface frames with oil to prevent bond with asphalt paving.

3.03 INSTALLATION - BASE COURSE

- A. Spread to uniform thickness; water and roll until firm enough to support material trucks without displacement or rutting.
- B. Compacted Thicknesses: As listed in Asphalt Pavements Section table.
- C. Density Required: 90% minimum.

3.04 INSTALLATION - PAVING

- A. General: Conform to Section 39, CALTRANS Standard Specifications.
- B. Placing: Spread to headers and/or temporary screeds, where required, with Barber-Greene self-propelled mechanical spreading and finishing equipment, or Architect-approved equal. Hand spread only in places inaccessible to mechanical spreader. Heat shovels, forks and rakes.
- C. Edges: At headers, lay to a thickness 4" deep x 8" wide at bottom, forming a footing. Slope bottom up 3:1 to meet typical paving thickness. Where paving stops against buildings, walls, curbs, or concrete walks, thickened edges are not required.
- D. Abutting Work: Where paving contacts rigid structures, thoroughly clean and coat contact surfaces with a film of asphalt emulsion and/or asphalt cement. Protect adjoining work from spotting and splashing or asphalt materials.
- E. Rolling and Smoothness: Roll per Section 39, CALTRANS Standard Specifications. Finished surface to be even, smooth, of uniform texture free of roller welts, true to place and line, and drain as indicated. Paving to have a density such that water will not penetrate.

R - Value Subgrade Soils - 7 (tested) Design Method - CALTRANS 1995

Traffic Index (Assumed)	Pavement Use	Flexible Pavements	
		Asphaltic Concrete Thickness (Inches)	Aggregate Base Thickness (Inches)
4.5	Auto Parking Areas	3.0	4.0
5.0	Light Traffic	3.0	4.5
5.5	Truck Traffic	3.0	4.5
5.5	Fire Lane	3.5	6.0
7.0	Bus Lane	4.0	6.0
	Site Walks and Hardcourt Areas	3.0	3.0

Notes:

1. Asphaltic concrete should be CalTrans, Type B, 1/2-in. or 3/4-in. maximum-medium grading and compacted to a minimum of 95% of the 75-blow Marshall density (ASTM D 1559) or equivalent.
2. Aggregate base should be CalTrans Class 2 (3/4-in. maximum) and compacted to a minimum of 95% of ASTM D1557 maximum dry density near its optimum moisture.
3. All pavements should be placed on 12 inches of moisture-conditioned subgrade, compacted to a minimum of 90% for flexible and 95% for rigid pavements of ASTM D 1557 maximum dry density near its optimum moisture.
4. Portland cement concrete should have a minimum of 3250 psi compressive strength at 28 days.
5. Equivalent Standard Specifications for Public Works Construction (Green book) may be used instead of CalTrans specifications for asphaltic concrete and aggregate base.

California Code of Regulations, Title 21, Division 2, Chapter 7, Section 14511.7, Fire Trucks, allows for a higher axle load for fire trucks than for standard commercial vehicles. Standard commercial vehicles are typically limited to an axle load of 18,000 pound and tandem axle loads of 36,000 pounds, but fire trucks are allowed a single axle load of 24,000 pounds and a tandem axle load of 48,000 pounds. According to data from the American Association of State Highway and Transportation Officials, 48,000 pound tandem axles like those found on many fire trucks, are about 4 times more damaging to pavements than 36,000 pound tandem axles. Restated, one 3-axle fire truck is approximately equivalent to four 3-axle standard trucks.

3.05 APPLICATION - SURFACE SEAL COAT

- A. Preparation: Clean paving surfaces of loose, foreign material.
- B. Application:
 - 1. Per manufacturer's recommendations.
 - 2. Mix into a slurry with three to six lbs. of sand per gallon of sealer.
 - 3. Protect adjacent structures from mixture.
 - 4. Apply evenly and spread immediately with rubber-faced squeegees; pull at angle from line of spread, to roll material toward operator. After each coat has dried, remove ridges with scraper.
 - 5. Total Application Rate: Apply at an undiluted rate of 0.2 gallons minimum per square yard. Increase application rate due to surface porosity per manufacturer's printed recommendations.
 - 6. Final seal shall be slurry seal as per Section 32 12 36.13.
- C. Protect from traffic for three (3) days minimum after application.

3.06 FIELD QUALITY CONTROL

- A. On-Site Work:
 - 1. Water Test: Flood test paving to show surfaces are free of standing puddles, and drain properly.
 - 2. Material Tests:
 - a. Made at District's option, by District selected Testing Lab.
 - b. District's Inspector to select test sample locations.
 - c. The Contractor is to repair test areas at no additional cost to District.
 - d. Testing costs, as stated in Section 01 41 00.

3.07 CLEANING

Remove equipment, excess materials, debris; and material splashes from abutting work.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. All new and existing asphalt pavement areas as indicated in the Drawings is to be seal coated.
- B. All existing asphalt pavement areas to receive seal coat as indicated in the Drawings is to have all cracks filled prior to seal coats.

1.02 RELATED SECTION

- A. Section 32 12 16.09 - Asphaltic Concrete Paving, Repair, Crack Filler and Seal Coats.
- B. Section 32 17 23.13 - Pavement Marking.

1.03 QUALITY ASSURANCE

- A. Qualification of workmen:
 - 1. Provide at least one person who shall be thoroughly trained and experienced in the skills required, who shall be completely familiar with the design and application of work described for this section, and who shall be present at all times during progress of the work of this section and shall direct all work performed under this section.
 - 2. For actual seal coating and operation of the required equipment, use only personnel who are thoroughly trained and experienced in the skills required.

PART 2 - PRODUCTS

2.01 SEAL COAT

- A. The surface Seal Coat of existing and new Asphalt Pavement shall meet Green Book, Specification No. 203-9 Seal Coat Asphalt Based.
- B. Over Kote Asphalt Pavement Coating, Over Kote Crack Filler and Over Kote Crock Filler II by Reed & Graham, Inc. or approved equal.

2.02 CRACK FILLER

- A. Over Kote Asphalt Pavement Coating, Over Kote Crack Filler and Over Kote Crock Filler II by Reed & Graham, Inc. or approved equal.

2.03 OTHER MATERIALS

All other materials, not specifically described but required for proper and complete installation of pavement seal coat, shall be provided to complete the work of this section.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

- A. Inspection: Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
 - 1. Verify that seal coat may be installed in strict accordance with the original design, all pertinent codes and regulations, and all pertinent portions of the referenced standards.

- B. Discrepancies:
 - 1. In the event of discrepancy, immediately notify the Architect.
 - 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

- C. New and existing Asphalt Paving:
 - 1. The surface shall be cleaned of all dirt, debris oil, or foreign matter. After thoroughly cleaning, dampen the surface with water. Remove any excess water prior to application of sealer. Rough or irregular areas are to be treated with a mastic mix consisting of two pounds of 30 mesh silica sand per gallon of seal coat, prior to the applications of seal coats.

- D. Repairing Existing Cracks:
 - 1. Less than 1/4" fill with Over Kote, Crack Filler by Reed & Graham, Inc. or approved equal.
 - 2. Greater than 1/4" but less than 1/2" fill with Over Kote, Crack Filler II by Reed & Graham, Inc. or approved equal.
 - 3. Greater than 1/2" but less than 1". Remove asphalt a minimum of 2" down or to sound pavement and re-pack area with asphalt paving mix following procedures under Section 32 12 16.09, Paragraph 3.03.
 - 4. Greater than 1". Follow procedure under Section 32 12 16.09, Paragraph 3.03.

- E. New Asphalt Paving is not to be seal coated for a minimum of 36 days after installation of asphalt, to allow new paving to cure and prevent slurry seal blistering.

3.02 APPLICATION

- A. Seal coat shall be a two-coat application, each at the rate of approximately 25 gallons per 1000 square feet of pavement for application of each coat at 3 mils minimum thickness. Application may be made with squeegees, brooms, or mechanical applicators designed for applying slurry seal. Application is to be made by experienced technicians. Finished surface shall be smooth, without ridges, loops, and holidays.

- B. Apply per manufacturer recommended procedure.

- C. Do not place seal coat when the atmospheric temperature is below 65°F, or during unsuitable weather.
- D. Provide **two (2)** applications of seal coats on both new and existing asphalt surface as indicated on the Drawings. Coats shall be a minimum two (2) days apart.
- E. At new asphalt paving the Contractor shall be required to stripe parking lot areas where parking lot work is indicated, immediately after placement of asphalt. Contractor shall re-stripe a second time, 45 days later after application of seal coats.

3.03 CLEANING AND PROTECTION

- A. After completion of operations, clean surfaces of excess or spilled slurry material.
- B. Do not allow any foot or vehicular traffic on paving for 24 hours minimum, or until paving slurry has dried.
- C. Provide proper barricades and warning devices for slurry seal protection until it is opened to traffic.

END OF SECTION

SECTION 32 17 23.13
PAINTED PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Parking lot markings; including parking bays, crosswalks, arrows, handicapped symbols, and curb markings.
- B. Roadway lane markings and crosswalk markings.
- C. "No Parking" curb painting.

1.02 REFERENCE STANDARDS

- A. FS TT-B-1325- Beads (Glass Spheres); Retro-Reflective.
- B. FS TT-P-1952 - Paint, Traffic Black, and Airfield Marking, Waterborne.
- C. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association.

1.03 SUBMITTALS

- A. See Section 01 33 13- Submittal Procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Certificates: Submit for each batch of paint and glass beads stating compliance with specified requirements.
- D. Maintenance Materials: Furnish the following for Glendale Unified School District's use in maintenance of project.
 - 1. See Section 01 60 00 - Product Requirements, for additional provisions.
 - 2. Extra Paint: 2 containers, 1 gallon size, of each type and color.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver paint in containers of at least 5 gallons accompanied by batch certificate.
- B. Deliver glass beads in containers suitable for handling and strong enough to prevent loss during shipment accompanied by batch certificate.
- C. Store products in manufacturer's unopened packaging until ready for installation.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.05 FIELD CONDITIONS

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Line and Zone Marking Paint: MPI No. 97 Latex Traffic Marking Paint; color(s) as indicated.
 - 1. Parking Lots: Yellow.
 - 2. Handicapped Symbols: Blue.
 - a. Equal to Color No. 15090 per Federal Standard 595B.
- B. Paint For Obliterating Existing Markings: FS TT-P-1952; black for bituminous pavements, gray for portland cement pavements.
- C. Reflective Glass Beads: FS TT-B-1325, Type I (low index of refraction), Gradation A (coarse, drop-on); with silicone or other suitable waterproofing coating to ensure free flow.
- D. Temporary Marking Tape: Preformed, reflective, pressure sensitive adhesive tape in color(s) required; Contractor is responsible for selection of material of sufficient durability as to perform satisfactorily during period for which its use is required.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify the Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Obliteration of existing markings using paint is acceptable in lieu of removal; apply the black paint in as many coats as necessary to completely obliterate the existing markings.
- D. Clean surfaces thoroughly prior to installation.
 - 1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.
- E. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.
- F. Establish survey control points to determine locations and dimensions of markings; provide templates to control paint application by type and color at necessary intervals.
- G. Temporary Pavement Markings: When required or directed by Architect, apply temporary markings of the color(s), width(s) and length(s) as indicated or directed.
 - 1. After temporary marking has served its purpose, remove temporary marking by carefully controlled sandblasting, approved grinding equipment, or other approved method so that surface to which the marking was applied will not be damaged.
 - 2. At Contractor's option, temporary marking tape may be used in lieu of temporary painted marking; remove unsatisfactory tape and replace with painted markings at no additional cost to Glendale Unified School District.

3.03 INSTALLATION

- A. Begin pavement marking as soon as practicable after surface has been cleaned and dried.
- B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F or more than 95 degrees F.
- C. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.
- D. Parking spaces for the disabled shall be marked according to CBC Sections 112913.3 and 11298.4.
- E. For other conditions, comply with California "Manual on Uniform Traffic Control Devices" for details not shown. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.
- F. Apply uniformly painted markings of color(s), lengths, and widths as indicated on the drawings true, sharp edges and ends.
 - 1. Apply paint in one coat only.
 - 2. Wet Film Thickness: 0.015 inch, minimum.
 - 3. Length Tolerance: Plus or minus 3 inches.
 - 4. Width: 3 inches minimum.
 - 5. Width Tolerance: Plus or minus 1/8 inch.
- G. Roadway Traffic Lanes: Use suitable mobile mechanical equipment that provides constant agitation of paint and travels at controlled speeds.
 - 1. Conduct operations in such a manner that necessary traffic can move without hindrance.
 - 2. Place warning signs at the beginning of the wet line, and at points well in advance of the marking equipment for alerting approaching traffic from both directions. Place small flags or other similarly effective small objects near freshly applied markings at frequent intervals to reduce crossing by traffic.
 - 3. If paint does not dry within expected time, discontinue paint operations until cause of slow drying is determined and corrected.
 - 4. Skip Markings: Synchronize one or more paint "guns" to automatically begin and cut off paint flow; make length of intervals as indicated.
 - 5. Use hand application by pneumatic spray for application of paint in areas where a mobile paint applicator cannot be used.
 - 6. Distribute glass beads uniformly on the paint lines within ten seconds without any waste, applied at rate of 6 pounds per gallon of paint; if the marking equipment does not have a glass bead dispenser, use a separate piece of equipment adjusted and synchronized with the paint applicator; remove and replace markings having faulty distribution of beads.
- H. Parking Lots: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.
 - 1. Mark the International Handicapped Symbol at indicated parking spaces.
 - 2. Hand application by pneumatic spray is acceptable.

- J. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.

END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. Principal Work Items Are:
1. Chain link fence.
 2. Concrete post foundations.
 3. Concrete mow strips.
 4. Hardware, except padlocks.
 5. Gates.
 6. Work Furnished But Installed by Another Section:
 - a. Sleeves for Posts: Where fencing is installed on continuous concrete curbs, and brick masonry walls furnish sleeves to Cast-In-Place Concrete Section 03 30 00.
- B. Related Work Specified Elsewhere:
1. Requirements in Addenda, Alternates, Conditions, and Division 1 collectively apply to this Work.
 2. Earthwork: Section 31 00 00.
 3. Ornamental Iron Fences and Gates: Section 32 31 19.
 4. Asphaltic Concrete Paving: Section 32 12 16.
 5. Cast-In-Place Concrete: Section 03 30 00.
 6. Finish Hardware: Section 08 71 00; padlocks and hardware at accessible path of travel.

1.02 SUBMITTALS

Shop Drawings: Submit for all sliding gates, and all swing gates where leaf width exceeds 9'-0"; reference to the Architect's Drawings; four copies. Refer to 01 33 00 Submittal for procedure.

1.03 DELIVERY, STORAGE AND HANDLING

Deliver materials with manufacturer's tags and labels intact. Handle and store so as to avoid damage.

1.04 JOB CONDITIONS

- A. Sequencing, Scheduling: Coordinate with earthwork and paving installers.
- B. Where fencing is installed on continuous concrete curbs and/or masonry walls, assist Concrete Section in proper placement of sleeves for fence posts.

PART 2 - PRODUCTS

2.01 MATERIALS

Fence components to be galvanically compatible.

2.02 FABRIC

- A. Drawn steel wire, hot-dipped zinc coated after weaving, ASTM A392-07 Class 1, 1.2 ounce per SF of wire surface, per ASTM A90/A90M-09 stripping test; withstand 5 one-minute immersions per Preece test per ASTM A392-07 and A90/A90M-09.
- B. Fence and Gate Fabric:
 - 1. One-piece fabric full-height for fence through 12'-0"; edges knuckle-knuckle selvage for fences 6'-0" high and below; edges shall be knuckle-twist for fences 6'-0" high and above.
 - 2. Mesh Size: 2" typical except fencing within 6' of buildings mesh size to be 1-1/2".
 - 3. Wire Diameter: No. 9 typical.

2.03 MATERIALS; FRAMEWORK

- A. Pipe: ASTM A120, Schedule 40, standard welded steel pipe, commercial hot-dipped zinc coated, 1.8 ounce per SF minimum evenly deposited; reasonably straight, burrs removed, free of defects and roughness.
- B. Sizes: For fencing 8' high or less.

<u>ITEM</u>	<u>INCHES</u>	<u>LBS/LF</u>
1. Line Posts:	2.375	3.65
2. Corner, Terminal and Pull Posts:	3.5	5.71
3. Pedestrian Gate Posts:		
a. Leaf 3'-0" through 8'-0" wide:	4.0	9.11
4. Driveway Gate Posts:		
For gate leaf widths as listed:		
a. 8'-1" through 13':	6.625	18.97
b. 13'-1" through 18':	8.625	28.55
5. Top Rails, Brace Rails and Transom Rails:	1.9	2.27
6. Gates: For gate leaf widths as listed.		
a. Frame through 12':	1.90	2.72
b. Frame over 12':	2.375	3.65
c. Bracing:	1.9	2.27

2.04 ACCESSORIES

- A. Wire: All galvanized.
 - 1. Tension: No. 6 galvanized steel cold drawn; ASTM A82.
 - 2. Ties: Soft annealed steel; FS QQ-W-461.
 - a. No. 9 galvanized to posts.
 - b. No. 14 galvanized to top rail, and tension wire.
 - c. Bottom tension wire: Marcellled No. 6 gauge, hog-ringed (not woven) to fabric, wrapped around line posts with spring at 150' centers.
- B. Galvanizing; Accessories, Except Wire: ASTM A153/A153M-05.
- C. Fittings:
 - 1. Tension Bars: 3/16" x 3/4", mild steel.
 - 2. Steel Bands: 1/8" x 1" typical, 1/8" x 3/4" at gates; milled steel.
 - 3. Post Caps: Cast malleable iron or pressed steel; snug fit to exclude moisture from posts; hole to accommodate top rail.
 - 4. Truss Rods: 3/8" diameter steel; adjustable length.
 - 5. Turnbuckles for Tension Wire: Eye/eye type, drop forged steel, 5/16" minimum screws with 4-1/2" minimum take-up.
 - 6. Bolts: 3/8" diameter minimum; cadmium plated.
 - 7. Couplings for Top Rail: Steel, 6" long; to fit inside rail; with expansion spring where noted.
 - 8. Miscellaneous: All other required fittings.
 - 9. Sleeves For Posts: Steel Pipe; diameters sized to suit posts. 12" deep for fence heights to 8' maximum; greater depths for higher fences.

2.05 GATE HARDWARE

- A. Gates which are placed across a required exit pathway leading to a safe dispersal area or public way shall comply with latest edition of CFC Section 1208 and latest edition of CBC Sections 11338.1.1.4 and 1007.3.11.
 - 1. Hardware for these gates shall be as specified in Section 08 70 00.
 - 2. Padlocks may be utilized to secure gates in the open position, but never used to secure gates in the closed position.
 - 3. These gates shall latch or lock by panic hardware, only.
- B. Galvanizing For Parts: ASTM A153/A153M-05; galvanize after fabrication.

- C. Hinges: Malleable iron, double clamping, non-lift-off, offset type for 180° swing.
- D. Latches: Malleable iron, forked or plunger-bar type, permit operation from either side of gate, gravity type automatically engaging gate frame; with padlock eye.
- E. Keeper: Malleable iron; automatically engage gate when swung open 180° and hold until manually released.
- F. Pairs of Gates:
 - 1. Stops: Flush steel plate, with anchors.
 - 2. Latch: Center drop rod or plunger bar; with integral padlock eyes.
- G. Sliding Gates: Manufacturer's standard "cantilever-type", heavy-duty track, ball-bearing hanger sheaves, guides, stays, latch with integral padlock eye, and all accessories.
- H. Gates in path of travel must comply with exit door requirements. (CBC Section 1133B.1.1.1.4 / ADAAG 4.13.3) Specify hardware that does not require pinching, grasping, or twisting motion to operate and provide solid kick plates 10" minimum high. Clear space below gate shall be 3" maximum above paving on both sides of the gate. The maximum effort to operate the gates shall not exceed 5 lbs. (22.2 N).

2.06 MISCELLANEOUS

- A. Portland Cement Concrete: 1:2-1/2:3-1/2 mix (2000 psi minimum).
- B. Non-Shrink Grout: As specified in Section 03 30 00.
- C. Paint touch-up for galvanizing work: Galvalloy Metalloy Products Co., Los Angeles, California as a standard of quality.

2.07 FABRICATION - GATES

- A. Frame: Weld frames with integral radius corners; horizontal bracing rails for gates exceeding 6' high; vertical bracing rails at 6' o.c. maximum for gates exceeding 9' wide; diagonal cross-bracing truss rods. Galvanize after fabrication.

- B. Fabric: Stretch taut; tension bars and bands a 15" o.c. maximum at vertical edges. Wire tie fabric at 12" o.c. maximum top, bottom, and bracing rails. Galvanized after weaving.
- C. Hardware: Attach all hardware securely. 2 hinges per gate leaf typical; 3 hinges per leaf where leaf exceeds 100 SF.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify that final grading and paving at fence location is completed without irregularities which would interfere with fence installation.
- B. Do not commence work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Layout: Measure and lay out complete fence line.
- B. Post Spacing: Locate line posts at equal-distance spacing in a run, but do not exceed 10' on center.

3.03 INSTALLATION - FOOTINGS

- A. Sizes:
 - 1. Post Footing Sizes: As detailed and scheduled on the Drawings.
- B. Holes: Drill holes in firm, undisturbed, or compacted soil.

3.04 ERECTION - FRAMEWORK

- A. Posts:
 - 1. Typical Installation; Posts Set Into Concrete Footings:
 - a. General: Set posts into concrete footings plumb, centered, and aligned; 3" concrete cover between post bottom and earth.
 - b. Concrete: Place in continuous pour in hole; tamp to consolidate; crown concrete to drain water away from posts.
 - 2. Installation Where Indicated; Posts Set Into Sleeves:
 - a. Check and verify that sleeves were properly installed by Concrete and Brick Masonry Sections.

- b. Set posts plumb and true to line.
 - c. Fill space between post and sleeve solid with non-shrinking grout. Mix and place per manufacturers printed recommendations.
3. Corner Terminal Pull Posts: Install at ends of runs, horizontal direction changes of 15° or more, vertical grade changes of 5° or more, ends of curved fence section; pull post each 500' run of fence.
 4. Gate Posts: Install each side of gates.
- B. Top Rail: Install continuous at top of all fencing; insert through posts caps; join pipe lengths (20'-0" plus or minus) with couplings, with expansion spring every fifth coupling.
- C. Post Bracing Assemblies: Install horizontal brace rail, and diagonal truss rod in each fence panel adjacent to terminal, corner, pull, and gate posts. Brace rail not required for 4' or less height fence.

3.05 ERECTION - FENCE FABRIC

- A. Install on outside of posts, next to property line; one continuous piece wherever possible; stretch taut.
- B. Fastenings:
1. At terminal corner pull gates and posts, thread tension bars through mesh; secure to posts with bands at 15" o.c. maximum.
 2. Wire-tie fabric to line posts at 16" o.c.; to top rail, brace rails, and bottom tension wire at 18" o.c.
- C. Bottom Tension Wire: Insert through bottom diamond of fabric; install a turnbuckle each 150' of wire; wire tie to posts.
- D. Clearances: Set bottom of fence fabric to maintain stated clear distances.
1. Mow Strip: 1" to 2"; trench and shape locally to permit uniform top and bottom alignment of fabric.
 2. Asphalt Concrete Paving: Touching surface.

3.06 ERECTION - GATES

- A. Install gates plumb and level to a tolerance of 1/4" in 10'.
- B. Install ground-set items in concrete.

C. Adjust hardware to provide smooth operation. Lubricate where required.

D. Upon final adjustment, weld in place all gate hardware.

3.07 INSTALLATION - MOW STRIPS

Where fence is not over paving, excavate as required and install 12" wide x 4" deep concrete mow strip under centerline of fence. Widen mow strip to join any paralleling walks or paving which are less than 2'-0" distance from fence line.

3.08 ADJUST AND CLEANING

A. Adjustment: Adjust brace rails and tension rods for rigid installation. Tighten hardware, fasteners, and accessories.

B. Cleaning: Remove excess and waste materials from project site.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS:
The work of this Section shall conform to Division 01 to this section herein.
- 1.2 SCOPE OF WORK:
Work of this Section includes the furnishing, adjusting, installing, and testing of mains, laterals, risers and fittings, quick couplers, gate valves, excavation and backfill, and all other work in accordance with the plans and specifications for a complete operating system. All work shall be in accordance with applicable City and County codes, and these plans/specifications.
- 1.3 RELATED WORK DESCRIBED ELSEWHERE:
A. Planting: Section 32 90 00
- 1.4 STANDARDS:
Materials and workmanship shall conform to the requirements of all applicable regulations and codes, except that requirements specified herein shall govern where they are greater. Refer and comply with the provisions of the following codes, specifications, and standards, except as otherwise shown or specified:
- A. National Electrical Code.
 - B. Electrical Safety Orders of the State of California, Division of Industrial Safety.
 - C. American Society for Testing and Materials International (ASTM):
 - 1. ASTM A53- Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. ASTM D1784- Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 - 3. ASTM D2466- Standard Specifications for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
 - 4. ASTM D2467- Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
 - D. American Society of Mechanical Engineers International (ASME):
 - 1. B36.10M- Welded and Seamless Wrought Steel Pipe.
 - E. American National Standards Institute (ANSI):
 - 1. ANSI B125.1 – Welded and Seamless Steel Pipe.
 - 2. ANSI B125.2 – Black/Hot-Dipped Zinc Coated Welded/ Seamless Pipe.
 - F. Federal Specifications:
 - 1. FS WW-P-460-Pipe Fittings: Brass or Bronze.
 - G. Ductile Iron Pipe (ANSI):
 - 1. ANSI/AWWA C 100
 - a. ANSI/AWWA C 105/A2.5 Polyethylene Encasement –Corrosive Protection
- 1.5 QUALITY ASSURANCE:
A. The Contractor shall maintain, continuously, a competent superintendent or foreman, who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of materials being installed and the materials manufacturer's recommended methods of installation, and who shall direct all work performed under this Section. The superintendent shall be authorized to represent the Contractor.

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- B. Prior to commencement of work, contractor shall verify drawing dimensions with actual field conditions, and exact location of irrigation water meter - point of connection provided by others. Verify existing pressure at point of connection; coordinate location and installation of new main line. Immediately report to the Landscape Architect and/or Owner all conditions, which prevent proper execution of this work.
- C. All assemblies specified herein shall be installed in accordance with the respective details. In the absence of detail Drawings or specifications pertaining to the specific items required to complete the work, the Contractor shall perform such work in accordance with the best standard practice and to the satisfaction of the Landscape Architect.
- D. Irrigation Contractor is responsible for replacing or repairing any acts of theft or vandalism during construction and the maintenance period.
- E. The Contractor shall obtain and pay for all permits and inspections required by outside agencies. Coordinate with the Water Purveyor procurement of all permits for the installation of Water Meters and Backflow Units –Refer to Civil Engineers Utility Plans for contact information.
- F. Due to the scale of Drawings, it is not possible to indicate all offsets, fittings, sleeves, etc., which may be required. Carefully investigate the structural and finished conditions affecting all of this work and plan this work accordingly, furnishing such fittings, etc., as may be required to meet such conditions. Drawings are generally diagrammatic and indicative of the work to be installed. The work shall be installed in such a manner as to avoid conflicts between irrigation systems, planting and architectural features.
- G. All materials furnished and installed shall be new and shall conform to the Standard Specifications for Public Works construction, current edition as adopted by the Owner.
- H. All materials except interconnect conductors shall have a three-year limited warranty. A five year warranty shall apply when the controller is installed in a pre-assembled stainless steel enclosure per the Owner's specification). The Contractor shall submit proof of warranty to the Owner prior to the start of the maintenance period. It is the Contractor's responsibility to obtain the necessary warranty inspections from the equipment supplier. No installation will be accepted without proof of warranty.
- I. All existing computerized irrigation control systems and all new computerized irrigation control system components shown on the plans shall be fully operational at final acceptance.
- J. All incidental parts which are not shown on the plans or specified herein and are necessary to complete the system shall be furnished and installed as though such parts were shown on plans or specified. All systems shall be in satisfactory operation at the time of completion.
- K. Any existing control/interconnect system shall be maintained in effective operation by the Contractor for the duration of the work. The Contractor shall notify the Landscape Architect 48 hours prior to performing any work on an existing system.
- L. Work noted as "NIC." (Not in Contract) is not part of this section.
- M. Permission to shut off any irrigation lines must be obtained from the Owner. Disruption of existing systems and services shall be kept to a minimum.

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1.6 SUBMITTALS:

- A. Product Data: Within five (5) days after award of the Contract, and before any materials of this Section have been delivered to the job site, submit to the Landscape Architect:
 - 1. A complete materials list of all items proposed to be furnished and installed under this Section.
 - 2. The manufacturer's recommended methods of installation which, when recommended for approval by the Landscape Architect, shall become the basis for review and accepting or rejecting actual installation methods used on the work when not otherwise specified or detailed.
- B. Materials and Samples: The Contractor shall, prior to the installation of any irrigation work, submit for recommended approval by the Landscape Architect, a list of materials and equipment he proposes to use. The material and equipment list shall include, but not be limited to, polyvinyl chloride pipe, control valves, irrigation heads, quick coupler valves, and controllers.
 - 1. Should the Contractor propose to use materials or equipment other than those listed on the plans, he shall submit samples of the make and type proposed. Samples shall be submitted a sufficient time in advance of the start of construction to allow a period of not less than seven (7) days for testing and recommended approval. Substitution of any product, material, or equipment without prior, written, recommended approval would not be permitted.
- C. Manufacturer's warranties: Shall not relieve the Contractor of his liability under the guarantee. Such warranties shall only supplement the guarantee.
- D. The Contractor shall submit to the Landscape Architect catalog data and full descriptive literature for approval of all items specified.
- E. Submit shop drawings and specifications for controller enclosure assembly(s), including electrical wiring schematic(s). Submit shop drawings and specifications for all special assemblies, e.g. booster pump(s), controller enclosure, central control computer system, flow sensing equipment, etc., if shown on the drawings.
- F. The Contractor shall furnish the articles, equipment, materials or processes specified by name in the drawings and specifications. No substitution will be allowed without prior written approval by the Architect.
- G. The Contractor shall submit to the Landscape Architect catalog data and full descriptive literature for approval of all items specified.
- H. Submit shop drawings and specifications for controller enclosure assembly(s), including electrical wiring schematic(s). Submit shop drawings and specifications for all special assemblies, controller enclosure, flow sensing equipment, etc., if shown on the drawings.
- I. Equipment or materials installed or furnished without the prior approval of the Landscape Architect may be rejected and the Contractor required to remove such materials from the site at his own expense
- J. Approval of any item, alternate, or substitute, indicates only that the product(s) apparently meet the requirements of the drawings and specifications on the basis of the information or samples submitted
- K. Manufacturer's warranties shall not relieve the Contractor of his liability under the guarantee. Such warranty shall only supplement the guarantee.

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- L. Material shall be of the best quality obtainable, of American manufacture, and shall comply strictly with the drawings and specifications. All equipment shall be new and unused prior to installation.
 - M. Project Record Drawings: Provide separate and complete Project Record Drawings prepared in accordance with the provisions of Sub-section 3.15, following
- 1.7 PRODUCT HANDLING:
- A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation and to protect the work and materials of all other trades.
 - B. Delivery: Polyvinyl chloride pipe shall be delivered to the work site in unbroken bundles or rolls packaged in such a manner as to provide adequate protection for the pipe ends, threaded or plain.
 - C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the recommended approval of the Landscape Architect and at no additional cost to the Owner.
- 1.8 IRRIGATION CONTROL SYSTEM:
- A. All materials furnished and installed shall be new and shall conform to the Standard Specifications for Public Works construction, current edition as adopted by the Owner.
 - B. The Contractor shall organize and conduct a pre-construction system familiarization meeting with Imperial Technical Services, Landscape Architect, and/or Irrigation Consultant.
 - C. All materials except interconnect conductors shall have a three-year limited warranty. A five year warranty shall apply when the controller is installed in a pre-assembled stainless steel enclosure per the Owner's specification). The Contractor shall submit proof of warranty to the Owner prior to the start of the maintenance period. It is the Contractor's responsibility to obtain the necessary warranty inspections from the equipment supplier. No installation will be accepted without proof of warranty.
 - D. All incidental parts which are not shown on the plans or specified herein and are necessary to complete the system shall be furnished and installed as though such parts were shown on plans or specified. All systems shall be in satisfactory operation at the time of completion.
 - E. Any existing control/interconnect system shall be maintained in effective operation by the Contractor for the duration of the work. The Contractor shall notify the Landscape Architect 48 hours prior to performing any work on an existing system.
 - F. The Contractor shall coordinate with the telephone company for connections to the service and/or installation of conduits, telephone conductors, jacks, and modems at the locations shown on the drawings. Minor changes caused by actual site conditions shall be made at no cost to the Owner. All changes to the plans shall be first approved in writing by the Landscape Architect.
- 1.9 EQUIPMENT TO BE FURNISHED:
- A. Supply as a part of this contract the following:
 - 1. Two sets of wrenches for disassembling and adjusting of each type of head installed.
 - 2. One Rain Master Pro Max Receivers and Transmitters for each site
 - 3. Two keys for opening valve box covers.

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4. One operating key shall be furnished for each five (or less) gate valves installed.
5. Two quick coupler keys with matching swivels with globe valves.
6. Manufacturer cut sheet and operation manual for controllers.
7. Two individually bound "Operating and Maintenance Manuals" detailing operation and maintenance requirements for irrigation systems. Include descriptions of all installed materials and systems in sufficient detail to permit maintenance personnel to understand, operate, and maintain the equipment.

Provide the following in each manual:

- a. Index sheet, stating Irrigation Contractor's name, address, telephone number and name of person to contact.
 - b. Duration of guarantee period, including all manufacturer's guarantees or warranties.
 - c. Equipment list providing the following for each item:
 - Manufacturer's name.
 - Make and model number.
 - Name and address of local manufacturer's representative
 - Spare parts list in detail.
 - Detailed operating and maintenance instructions for major equipment.
- B. The above-mentioned items shall be turned over to the Owner at the conclusion of the project, prior to final payment.
- C. In addition to the above-mentioned maintenance manuals, provide the Owner's maintenance personnel with instructions for major equipment and show evidence in writing to the Landscape Architect at the conclusion of the project that this service has been provided.

1.10 COOLING SYSTEM COACHES SWITCH - CONTROLLER:

- A. The contractor shall notify the district representative along with the architect and manufacturer's representative prior to installation of Cooling System to verify location, method of installation and workmanship.
- B. Refer to Irrigation Plans and details for type and Model number.

1.11 GUARANTEE:

The irrigation system shall be guaranteed for a period of one (1) year following site acceptance, in accordance with Sub-section 3.18, following.

PART 2 - MATERIALS

2.1 GENERAL:

All materials shall conform to Section 212 of the "Standard Specifications,"

2.2 FLOW SENSING WIRING: (WHERE APPLICABLE)

- A. The flow sensor wire shall be a two conductor 20 AWG fully annealed solid tinned copper per ASTM B-33, flexfoil aluminum shield, black jacket, direct burial BLK, WHT as manufactured by Rain Master, Inc. (product #EV-CAB-SEN).
- B. Flow sensor wire may be extended to a maximum distance of 2,000 feet from the location of the assembly to which it is connected. Wire shall be installed in a 1 1/4" PVC Schedule 40 pipe.
- C. All conductors shall be the same type and shall be of the sizes shown on the drawings as required for proper operation of the systems.

2.3 AUTOMATIC CONTROLLER:

- A. The Irritrol MC-E Series. The controller shall have the following features and functions:
 - 1. Stainless steel pedestal enclosure.
 - 2. Station configuration options (4, 6, 8, 12, 18, 24, 30, 36, 42 or 48 stations. Dedicated outputs for 2 normally closed master valves, 1 normally open master valve, and remote alarm system and flow sensor connection.
 - 3. Built-in remote control jack. Permanent internal remote mount available.
 - 4. Built-in transient protection.
 - 5. Optional lightning protection available.
 - 6. Audible tone(s) for valid or invalid operator entry.
 - 7. Lifetime retention of the user's program and date/time, without the use of batteries.
 - 8. All outputs are protected from field wiring short circuits.
 - 9. Built in amperage meter to accurately measure and diagnose valve solenoid electrical problems.
 - 10. Modular architecture. Modular output boards (6 or 12 station) facilitate maintenance and eliminates total controller down time.
- B. Scheduling Capabilities
 - 1. Operation of 12 conventional programs with 8 start times, 48 ISC (individual station control) or a combination of each.
 - 2. Watering based upon 14-day schedules, skip day schedules, or 31-day schedules.
 - 3. Continuous cycling of programs based upon user established start and end times, with a programmable delay/soak time.
 - 4. Water budget per program from 0 to 999% in 1% increments for adjustment of program run times.
 - 5. Program by time.
 - 6. Programmable monthly water total terminates over budget irrigation.
 - 7. Quick station programming allows groups of stations to be programmed with the same runtime.
- C. Program Setup Capabilities
 - 1. Programs overlap protection or concurrent operation.
 - 2. Irrigation programs, lighting programs, security, etc. (Non-irrigation programs are independent of rain shutdown mode.)
 - 3. Inter station delay from 0 to 255 seconds.
 - 4. Runtimes from 1 second to 24 hours programmable in hours/minutes or minutes/seconds.

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5. Master valve selections: 2 Normally Closed Valves or Normally Open Valves with programmable delay from 0 to 600 seconds.
- D. Maintenance and Alarm Diagnostic Capabilities
1. Flow monitoring. Automatic alarm processing (which provides station and/or master valve shut down and program advance as required) diagnosing and reporting station underflow and overflow, mainline breaks, and unscheduled flows. Maximum upper flow limit is 2000 GPM.
 2. Electrical field wire monitoring. Automatic alarm processing (which provides station shutdown and program advance) for station over current, short circuits, broken field wiring or faulty solenoids.
 3. Power monitoring. Automatic alarm processing/reporting for power outages and power restoration. Intelligent program resumption for all outages or power glitches, no lost cycles or water window violations.
 4. Communication monitoring. Automatic alarm generation/reporting for lost communications or restoration when using hard wire communications. Automatic fault isolation of communication wiring problems to wire path between controllers.
 5. Diagnostic lights (LEDs) for all station outputs as well as the dedicated outputs: MV1, MV2, N.O. MV, and PUMP. Lights indicate when 24 VAC is at output terminal.
 6. Built-in test (BIT) functions allow selected controller circuitry to be field-tested.
 7. Manual test mode. Allows user to automatically advance from station to station using manual run time while displaying valve solenoid electrical current for each station as well as station flow in GPM.
 8. Manual station and manual multi-station modes. - Turns on any station for user entered runtime and automatically selects usage of the proper master valve and/or pump for this station. Multi-station mode allows any single station or output to be turned on individually or in combination with any other station(s). Valve solenoid electrical current is displayed.
 9. Manually entered program. Allows user to enter a one-time program to be run immediately or scheduled for later in the day. The manual program is independent of automatic programs and shall start only one time.
 10. Manual start of automatic programs (1-12). Start any program independent of the scheduled start time and water day.
- E. Miscellaneous Features
1. English/Spanish language selection.
 2. Weather Monitoring System: Climate Logic series as manufactured under Irritrol
 - a. Setup for the system shall require the controller to be programmed for the hottest time of the year for the location and zones or stations be assigned to program A.
 - b. After establishment of communication between the module and weather sensor, the weather sensor must be installed outside where it can receive full sun and unsheltered rain fall.
 - c. Wireless signal range shall be a maximum of 1,000 feet uninterrupted line of sight.
 3. Omit by date allows the user to enter up to 15 dates to exclude irrigation.
 4. Operates as a standalone or central.
 5. Flow Max - This exclusive feature allows controllers with a single point of connection to share master valves, and flow meters without the need for peripheral wiring/relays.
 6. Automatic protection and report for main line breaks, unscheduled flow, station high and low flow.
 7. Read flow at any controller
 8. Dynamic monitor shows system status at all times

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- F. Electrical Specifications
1. Transformer input shall be 120V ac; 60Hz. Transformer output shall be 24V ac, 2.08 AMPS.
 2. Maximum output per station shall be: 24V ac, 1.24 AMPS
 3. Maximum operating output to valves shall be: 24V ac 1.80 AMPS (including Master Valve)
 4. Controller shall have optimum 2-stage primary and secondary surge protection.

2.4 REMOTE CONTROL:

- A. The Pro Max™ Remote Control System is manufactured by Rain Master Irrigation Systems, Inc. (PROVIDE A HAND-HELD WIRELESS REMOTE CONTROL UNIT (ONE PER EACH SITE)The remote control system has the following features and functions:
1. Can be used with any manufacturers' 24 volt controller.
 2. Small compact transmitter with belt clip.
 3. Auto-up and auto-down operation.
 4. Independent control of Master Valve and/or Pump.
 5. Single or Multi-station on capability.
 6. Timed station operation selectable from 1 to 60 minutes.
 7. Control up to 999 individual receivers from a single transmitter.
 8. Turn a program on or off.
 9. Small, compact receiver for permanent internal mount.
 10. Detects (provides an audible alert) and protects against field wiring short circuits.
 11. Automatic resetting circuit breakers, no fuses required.
 12. Receiver has built-in safety default to automatically turn station off after 60 minutes.
 13. Audible transmitter and receiver tones verify proper Pro Max operation at all times.
 14. High tech power miser circuitry means no more battery recharging required (no down time).
 15. Transmitter has a single replaceable lithium battery that can be purchased locally and field replaced, no battery charger needed.
 16. Audible alarm warns of low power condition.
 17. All metal construction with shock absorbing bumpers.
 18. Water and mud resistant.
 19. Comes with a hard cover carrying case.
 20. Utilizes three mechanisms to insure reliable, interference communications:
 21. Electrical Characteristics – Input Power
 - a. Receiver, 22-32 VAC, 50/60 Hz
 - b. Universal Adapter, 22-32 VAC, 50/60 Hz
 - c. Transmitter, 6 volt lithium battery (user replaceable)
 22. Electrical Characteristics – Output Power
 - a. Receiver/Universal Adapter, 24 VAC, 1.5 Amps maximum total output (36VA), 1 Amp per station or Master Valve/Pump
- B. Mechanical Characteristics
1. Pro Max Receiver
 - a. Dimensions: 6 ¼ inch length x 3 ¼ inch width x 1 1/16 inch height
 - b. Weight: 11 oz
 - c. Operating Temperature: 0 to 60 degrees Celsius (32 to 140 Degrees Fahrenheit)
 - d. Storage Temperature: -20 to 70 degrees Celsius (-4 to 158 Degrees Fahrenheit)
 - e. Humidity Range: 0 to 90% non-condensing

2. Pro Max Universal Adapter
 - a. Dimensions: 6 ¼ inch length x 3 ¼ inch width x 1 1/16 inch height
 - b. Weight: 13 oz
 - c. Operating Temperature: 0 to 60 degrees Celsius (32 to 140 Degrees Fahrenheit)
 - d. Storage Temperature: -20 to 70 degrees Celsius (-4 to 158 Degrees Fahrenheit)
 - e. Humidity Range: 0 to 90% non-condensing

 3. Pro Max Transmitter
 - a. Dimensions: 3 inch length x 1 3/8 inch width x 5 1/2 inch height
 - b. Weight: 12 oz
 - c. Operating Temperature: 0 to 60 degrees Celsius (32 to 140 Degrees Fahrenheit)
 - d. Storage Temperature: -20 to 70 degrees Celsius (-4 to 158 Degrees Fahrenheit)
 - e. Dimensions: 6 ¼ inch length x 3 ¼ inch width x 1 1/16 inch height
 - f. Humidity Range: 0 to 90% non-condensing
- 2.5 MASTER VALVE: (WHERE APPLICABLE)
- A. Body: Cast iron, epoxy coated
 - B. Normally Open-master valve
 - C. Flow Rate: 0-360 gpm
 - D. Pressure: 20-200 psi
- 2.6 FLOW METER: (WHERE APPLICABLE)
- A. Data Industrial IR Series-
 - B. IR Sensor
 1. Flow Ranges: 0.5 – 30 feet/second
 2. Supplied with two single conductor, 18 AWG solid copper wire leads 48 inches in length with U.L. Style 116666 direct burial insulation.
- 2.7 PIPE:
- A. Standard PVC pipe shall be used. PVC pipe in accordance with AWWA Guidelines for the Distribution of potable Water.

 - B. Manufacture from virgin polyvinyl chloride compound in accord with ASTM 1785, 2241, 2672 or 3139.; hydrostatic design stress rating not less than 2,000 psi. All pipe shall be PVC in accordance with ASTM 1785, 2241, 2672, 3139 Type 1, Grade 1
 1. Mainline shall be determined as follows:
 - 1 1/2 " and smaller shall be Sch. 40 PVC, 1120/1220 Streamline solvent weld
 - 2" to 3" shall be CL 315 PVC solvent weld with thrust blocks
 2. All 2" and larger shall have thrust blocks. All ends, corners, etc. on mainline which is 2" and smaller which would receive thrust from the mainline shall have a thrust block.
 3. Lateral Lines shall be 1120/1220 Sch. 40 Streamline solvent weld.
 4. All pipes shall be continuously marked with: Manufacturers name, nominal size, PVC type, pressure rating, SDR, NSF seal, and date of extrusion.

 - E. Seamless copper water tube, ACT B88, Type "K", drawn temper.

 - F. Brass screwed pipe shall be red brass conforming to Federal Specification #WW-P-351.

 - G. Poly Swing Pipe; linear low density polyethylene, black in color, O.D. 0.69, I.D. 0.49, wall thickness 0.20, pressure rating 80 psi at 110 degrees F.

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- H. All pressure supply lines under vehicular paving to be installed with a PVC Schedule 40 sleeve, the sleeve shall be a minimum of twice the irrigation line diameter and shall extend a minimum of twelve inches (12") beyond such pavement. All other Irrigation Lines Sleeve or Low Voltage Control Wire Sleeves shall be PVC Schedule 40 polyvinyl chloride.

2.8 FITTINGS:

- A. Mainline
 - 1. Leemco restraint systems – ductile Iron restrain system with slanted bell fittings.(Use at all change in direction of mainline pipe servicing artificial turf cooling systems only.)
 - 2. Mainline Schedule 80 PVC Solvent Weld ASTM D 2464.
- B. Laterals Schedule 40 PVC ASTM D 2466, solvent weld, injected molded, IPS deep socket. NSF Seal of approval. Tee's and ell's are to be side gated.
 - 1. Laterals - PW Pipe CL 200 for Landscape Areas.
 - 2. Schedule 40 PVC - Lasco under paving
 - 3. Schedule 80 PVC- Lasco
- C. Reducer tees will be used in cases of pipe size reduction. Bushing will only be allowed in cases of reduction where such a reducer tee is not manufactured.
- D. Rigid PVC Nipples: ASTM D1785, Schedule 80, Type 1, molded threads.
- E. Schedule 40 PVC street ells.
- F. Brass: Red brass conforming to Federal Specification #WW-P-351.Schedule 40 threaded nipple stock, tees, ells, and unions.
- G. Copper - Wrought solder-joints.

2.9 FITTING CONNECTION:

- A. Solvent Cement: ASTM D2564 for PVC Pipe and fittings.
- B. Use heavy body cement for Sch 80 fittings. Follow ASTM procedures for all pipe welding and installation. Use Teflon Tape at all threaded fittings.
- C. PVC Primer: Use in all cases as recommended by pipe and fittings manufacturer.
 - 1. IPS Weld -On P - 70 primer
 - 2. IPS Weld -On 2711 (gray) cement
- D. PVC to metal joints shall be made with PVC Schedule 80 threaded fittings into galvanize with female adapter to PVC pipe. The PVC fitting shall be hand tightened, plus one turn with strap wrench. Joint compound shall be IPS weld on Teflon pipe joint compound or equal.
- E. Metal-to-Metal joints: graphite and oil lubricant or Teflon paste on male threads only.
- F. Cast Copper Flange Fittings conforming to ASTM B584/ANSI B16.18, max pressure rating: 300psi, Temp range-100 degree to 250 degree.
- G. Ductile Iron Flanged Fittings: ASTM A536-ANSI/AWWA C 110/A21.10, UL and FM requirements, pressure rating 250 psi rating for 1"-48" sizes and 150psi rating for 54" – 64"

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2.10 SLEEVES AND CONDUIT:

For use under paving and hardscape as sleeves for irrigation pipe and conduit for control wire shall be PVC;

1 ½" and Smaller shall be Sch. 40
2" and 2 ½" shall be Class 315
3" and Larger shall be Class 200.

- A. Only standard lengths of pipe shall be used. Couple and weld only when length required is longer than a standard manufactured length.
- B. Sleeves shall be a minimum of 2 pipe sizes larger than the pipe it serves and include a tracer wire.
- C. See details for specifications of installation.
- D. Never exceed 60 feet on continual sleeve in any area.
- E. Extend sleeves 12" beyond edge of hardscape.

2.11 PIPE QUALITY AND PROTECTION:

- A. Pipe manufactured more than two years before installation not permitted. All pipes shall have been protected for sun exposure during storage and installation.
- B. Pipe which show any sign that it has not been protected from exposure to sun at any time shall is not permitted.
- C. Wrap all ferrous metals where come in contact with soil with Polyethylene encasement - corrosive protection

2.12 GALVANIZED PIPE AND FITTINGS:

- A. All galvanized steel pipe shall be Schedule 40, threaded, coupled and hot-dip galvanized, and shall comply with ASTM A120 and A53.
- B. All fittings for galvanized steel pipe shall be 150 psi rated galvanized malleable iron, banded pattern.
- C. Pipe sizes indicated on the Drawings are nominal inside diameter unless otherwise noted.
- D. Wrap all ferrous metals where come in contact with soil with Polyethylene encasement - corrosive protection

2.13 COPPER PIPE AND FITTINGS:

- A. Pipe: Type K, hard tempered.
- B. Fittings: Wrought copper, solder joint type.
- C. Joints shall be soldered with silver solder, 45% silver, 15% copper, 16% zinc, 24% cadmium, solidus at 1125 Degrees F. and liquidus at 1145 Degrees F.
- D. Wrap all ferrous metals where come in contact with soil with Polyethylene encasement - corrosive protection

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- 2.14 BRASS PIPE AND FITTINGS:
- A. Brass pipe shall be 85% red brass, American National Standard Institute (ANSI), Schedule 40 screwed pipe.
 - B. Fitting shall be medium brass, screwed 125-pound class.
 - C. Wrap all ferrous metals where come in contact with soil with Polyethylene encasement - corrosive protection
- 2.15 SHUT-OFF VALVES (GATE VALVES):
- A. Valves 2" and smaller shall be bronze ball valves; ASTM B 584 body, 150 psi saturated steam rated, 600 psi cold working pressure, two-piece body, blow-out proof stem.
 - B. 2 ½ and 3 inches shall be cast iron gate valves; ASTM A 126 Class B body, 125 psi saturated steam rated, 200 psi cold working pressure, bolted bonnet, non-rising stem, threaded connections, solid wedge, bronze mounted, provide with cross-type operating wheel.
 - E. 4 inches and larger shall be cast iron gate valves; ASTM A126 Class B body, 125 psi saturated steam rated, 200 psi cold working pressure, bolted bonnet, non-rising stem, flanged connections, solid wedge, bronze mounted, provide square operation nut.
 - F. All shut off valves shall have a Christy's Maxi Tag, stamped brass tag marked with "CLOSE VALVE SLOWLY" in English and Spanish mounted on bottom side of valve box lid.
- 2.16 CONTROL WIRE:
- A. All control wire shall be of the Underwriter's Laboratory type UF (underground feeder), single conductor, solid copper, plastic insulated, 600 volt rated, for direct burial applications; maximum conductor operating temperature, 60 degrees C. for both wet and dry locations. Wire composition is as follows:
 - 1. Conductor - the conductors shall be solid annealed uncoated copper meeting the applicable requirements of the latest revisions of ASTM B-3.
 - 2. Insulation - the insulation shall be colored plastic which meets the test requirements of I.P.C.E.A. (The Insulated Power Cable Engineer's Association) Pub. No. S-61-402, dated July 1961, Section 3.7 for 60 degrees C. polyvinyl chloride insulation. The insulation shall be flame retardant, resistant to fungus, resistant to corrosive fumes, suitable for wet locations and furnish some degree of inherent protections against mechanical abuse. Insulation thickness shall be 47 mils for AWG #14, #12 & #10, and 62 mils for AWG #8.
 - 3. Color Coding - the conductor insulation shall be color coded as follows:
 - a. All pilot (valve control) wires shall be uniquely colored for each controller on the site.
 - b. All common ground wire shall be white with a colored stripe to match the control wire color associated with that controller (i.e. if controller 'A' has red control wires, the common wire for controller 'A' shall be white with a red stripe).
 - 4. Wire Connections for direct burial shall be "one step" waterproof wire connectors.
 - 5. All wire for control for valves and pump start relays shall be insulated solid copper conductor of type approved for direct burial. Use color-coded wire for pilot wires, a different color for all valves of each controller, and install per valve manufacturer's specifications and wire chart. Common wire for each controller shall be white with stripe of same color as pilot wires. Spare wires shall be black. A color different from all pilot and extra wires shall be used for master valve and flow sensor wires.

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- B. Sizing of wire shall be in accordance to manufacturer's recommendations, in no case less than #14 in size.
 - C. Connections on 24 volt wire shall be made by Scotchloc. Connector Seating Pack #3577 as manufactured by the 3M Company, Dri-Splice DS-400 as manufactured by Spears, or approved equal.
 - D. Higher voltage line connections or 110 volt shall be made by clamp and waterproofed with 3M Company Scotchcast splicing kits or approved equal.
- 2.17 WIRE SPLICES:
- A. Conductors shall be installed with no underground splices, unless absolutely necessary and unavoidable. Any and all underground splices that are required to be made, must be approved by the Architect, and shall be placed in a suitable type valve box for easy access.
 - B. Wire splices on the two conductor cable communication wires shall be made with 3M DBY splice kit or approved equal.
 - C. Wire splices on the multi-conductor cable communication wires shall be made with Preformed Super Serviseal with Polybee sealant (product #8006039).
- 2.18 AUTOMATIC CONTROL VALVES (ELECTRIC):
- A. All automatic control valves (electric) shall be globe or angle pattern, electrically controlled, hydraulically operated, single seat, normally closed.
 - B. The valves shall be actuated by a normally closed solenoid valve operator, using a 24-volt, 60-cycle alternating current. The wires in the coil of the solenoid shall be embedded in an epoxy resin. The entire solenoid shall be enclosed in a watertight housing. Valves shall automatically close in event of electrical power failure.
 - C. All automatic control valves shall have a flow control device for manually adjusting the amount of flow of water through the valve. The flow control device shall be adjusted so that the pressure at the nozzle of the sprinkler head farthest from the automatic control valve shall be that as specified in the irrigation legend per plan. The pressure at the sprinkler head shall be measured by means of a pilot tube and pressure gauge while the sprinkler head is operating.
 - D. Automatic control valves shall be as specified on the plans. Reference the irrigation plans, details, and legends for size and appropriate model number.
 - E. Tags: Christy's Standard Irrigation ID Tags.
- 2.19 VALVE BOXES:
- A. Required for each remote control valve and stubbed ends of control wires. The valve box shall be durable plastic: NDS or an approved equal and identified with letters "RCV" stenciled two inches (2") high on the outside of the cover with purple lid cover.
 - 1. NDS #314BCB Series - Standard rectangular with bolt-down cover.
 - B. Quick coupling valve boxes shall be round durable plastic: NDS or an approved equal with purple lid cover. The cover shall be branded with the letters "QCV," two inches (2") high
 - 1. NDS #312BCB Series - 10" round with bolt-down cover.

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- C. Gate valve and ball valve boxes shall be durable plastic: NDS or an approved equal with purple lid cover. The cover shall be identified with the letters "GV" or "BV", two inches (2") high stenciled on the outside of the cover.
 - 1. NDS #312BCB Series - 10" round with bolt-down cover.
- 2.20 SPRINKLER HEADS:
 - A. As per drawings.
- 2.21 SWING JOINTS:
 - A. Swing joints shall consist of schedule 40 PVC Street ells and schedule 80 nipples of proper length per sprinkler head for rotor heads and marlex for street ells and swing pipe for spray heads.
- 2.22 PULL BOX:
 - A. All pull boxes shall be Carson (concrete), or equal, for connection of conduit and route of communication and sensor cable. The pull box will have a cast iron lockable traffic lid.
- 2.23 AUTOMATIC CONTROLLER – COACHES SWITCH:
 - A. Refer to Irrigation Plans and details for Controller type and Model number.
 - B. Install Coaches Switch per Manufacturer Specifications. Contractor shall obtain Manufacturer cuts sheets, review information, and comply with installation instructions.
- 2.24 BACKFLOW DEVICE: See Irrigation Plans
 - A. Wrap all ferrous metals where come in contact with soil with Polyethylene encasement - corrosive protection.
- 2.25 IRRIGATION BOOSTER PUMP:
 - A. UL Listed as a Packaged Pumping System.
 - B. 1/8" Marine Graded Aluminum Enclosure Fan
 - C. 12 gauge steel lockable enclosure with exhaust fan.
 - D. Pressure reducing valve with back check feature.
 - E. Threaded inlet & discharge piping.
 - F. Station isolation valve.
 - G. High efficiency horizontal centrifugal pumps with back pullout design feature.
 - H. NEMA 12 UL Listed panel with Programmable Logic Controls.
 - I. NEMA 3R Service rated service disconnects. Pressure, flow or pump start configuration.
 - J. S.L.A.P. (Surge & Lightning Advanced Protection)
 - K. Solid state overload (for phase, imbalanced and low voltage)
 - L. Low discharged pressure with override.
 - M. Pump over-temperature.
 - N. Fusible motor short circuit protection.

PART 3 - EXECUTION

- 3.1 GENERAL:

All work shall conform to Section 308 of the "GREEN BOOK Standard Specifications FOR Public Works Construction" and except as modified herein. No work of this Section other than sleeving under pavement shall commence prior to the completion and acceptance of all grading work specified in Section 02910, Landscape Grading.

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- A. Prior to all work of this Section, carefully inspect existing site conditions and equipment. Verify available pressure at point of connection and location of water meter provided by the Water Department or on the Civil Engineer's drawings. Coordinate with the Water Purveyor procurement of all permits for the installation of Water Meters and Backflow Units –Refer to Civil Engineers Utility Plans for contact information.
- B. Verify that irrigation system may be installed in strict accordance with all pertinent codes and regulations, the original design, the reference standards and the manufacturer's recommendations.
- C. In the event of discrepancy, immediately notify the Landscape Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.
- D. Trenches and other excavations for irrigation pipe and appurtenances shall be excavated true to alignment and grade, and shall be of ample size for the proper performance of installation work, review, testing and backfill.
- E. Protect all existing utilities and repair any damage to existing utilities with matching new materials, at no increase in contract price.
- F. Generally, piping under concrete shall be installed by jacking, boring or hydraulic driving. Where any cutting or breaking of pavement, track sections and/or concrete work is necessary, it shall be removed and replaced by the Contractor. Permission to cut or break pavement, and/or concrete shall be obtained from the Owner. No hydraulic driving will be permitted under asphalt concrete paving or track sections.
- G. Coordinate with planting operations, as twelve-inch (12") deep cross-ripping is required prior to irrigation systems installation. (Cross-ripping is part of the planting work).

3.2 UTILITY SERVICES:

- A. Contractor shall provide for connections existing electrical services at locations indicated on the drawing.
- B. Contractor shall connect new mainline to water services at locations indicated on the irrigation plans drawings. The Contractor shall coordinate with District exact location of irrigation point of connection. Coordinate with the Water Purveyor procurement of all permits for the installation of Water Meters and Backflow Units –Refer to Civil Engineers Utility Plans for contact information.
- C. Contractor shall verify power sources shall be as indicated on the drawings.
- D. The Contractor shall be responsible for making electrical connections to the automatic controller and wire circuits from remote control valves to controllers. All electrical work shall be in accordance with all local and /or county ordinances. Wire sizes to be as per manufacturer's specifications.

3.3 LAYOUT:

- A. All piping or equipment show diagrammatically on drawing outside of planting areas shall be installed inside planting areas whenever possible.
- B. Layout each sprinkler head and make any minor adjustments required due to differences between actual site conditions and the Drawings. Minor adjustments shall be maintained within the original design intent. Protect in place all existing trees and shrubs.

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- C. Layout each system using staking method as approved by Owner's Representative. Maintain and protect approved staking layout.

3.4 TRENCHING AND BACKFILL:

A. Trenching:

1. Minimum trench width shall be six inches (6").
2. Minimum trench depth below bottom of pipe shall be two inches (2").
3. Minimum cover shall be based on finished grades, unless otherwise noted on Drawings.
 - a. Lateral Line cover shall be no more than twelve inches (12") and not less than eight inches (8").
 - b. Main Line minimum cover shall be eighteen inches (18") for lines two and one-half inches (2-1/2") and less; twenty-four inches (24") for lines two and one-half inches (2-1/2") and larger.
 - c. Pipe and Wire Sleeves minimum cover shall be twenty-four inches (24").

B. Backfill:

1. All plastic pipes shall be bedded and encased with approved backfill material free of rocks and clods as indicated in the following table and/or shown on the plans. Mainlines and wires shall be encased with clean sand as called for in the details. All sleeving under hardscape shall be encased in clean sand as called for in the details.

Thickness Under Pipes Minimum	Thickness Above Pipes Minimum	Thickness at Side of Pipes Minimum
Two inches (2")	Four inches (4")	Two inches (2")

2. Provide not less than six inches (6") clearance between each line and not less than six inches (6") clearance between lines of other trades, unless otherwise noted.
3. Do not install parallel lines directly over any other line.
4. The balance of backfill material shall be approved soil. Unsuitable material, including clods and rocks over three fourths inch (3/4") in size, shall be removed from the premises and disposed of legally at no cost to the Owner.
5. Backfill material shall be sufficiently compacted under and on each side of the pipe to provide support free of voids. Pipe joints shall remain exposed until the completion of pressure and leakage test, unless authorized by the Architect. The top six inches (6") of backfill shall be free of rocks over one inch (1"), subsoil, rubbish and debris.
6. The remainder of the backfill material shall contain no lumps or rocks larger than two and three fourths inches (2-3/4"), nor contain rubbish and debris.
7. Backfill shall be tamped or puddled to the dry density of adjacent soil. Backfill within areas of structurally compacted soils shall be returned to the original relative density as before trenching.

3.5 INSTALLATION OF PIPE:

- A. Unless otherwise specified, the construction of lateral lines and main lines shall include excavation and backfill, the furnishing, installing and testing of pipe, tube and fittings, the furnishing and installing of anchors, thrust blocks and location wire, the improvements, line flushing and testing, and all other work in accordance with the plans and specifications.
- B. Polyvinyl chloride pipe shall be installed in such a manner so as to provide for expansion and contraction as recommended by the manufacturer.
- C. All polyvinyl chloride pipes shall lay free in the trench with no induced strain. Where there is evidence of induced pipe strain, the Contractor shall be required to make pipe cuts and install angle fittings as necessary to eliminate the strain.

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- D. When a connection is plastic to metal, a PVC male adapter or Sch 80 PVC nipple shall be used threaded into the metal female threaded fitting. The male adapter or nipple shall be hand-tightened, plus one turn with a strap wrench. Joint compound shall be IPS weld-on Teflon pipe joint compound or equal. Do not connect male-threaded fittings into female threaded plastic fittings.
- E. The Contractor will be required to remove and replace any fitting, which induces a torque strain to the pipe.
- F. Polyvinyl chloride pipe shall be cut with a PVC pipe cutter, hand saw or hack saw with the assistance of a square and sawing vise or in a manner so as to ensure square ends. Burrs at cut ends shall be removed prior to installation so that a smooth unobstructed flow will be obtained.
- G. All plastic-to-plastic joints shall be solvent-weld joints. Only the solvent recommended by the pipe manufacturer shall be used.
- H. The solvent-weld joints shall be made in the following manner:
 - 1. Thoroughly clean the mating pipe and fitting with a clean dry cloth.
 - 2. Try the parts for fit. The parts should "dry-mate" between one-third (1/3) and two-thirds (2/3) the depth of the socket. If adequate insertion is not obtained, or bottoming occurs, try another part until a satisfactory "dry-fit" is obtained.
 - 3. Apply a uniform coat of solvent to the outside of the pipe with a non-synthetic bristle brush.
 - 4. Apply a uniform coat of solvent-weld to the fitting socket.
 - 5. Reapply a light coat of solvent-weld to the pipe and quickly insert it into the fitting.
 - 6. Give the pipe or fitting a quarter turn to ensure even distribution of the solvents and make sure that the pipe is inserted to the full depth of the fitting socket.
 - 7. Hold in position for at least fifteen (15) seconds.
 - 8. Wipe off excess solvent that appears at the outer shoulder of the fitting.

NOTE: For PVC Type I, 1120-1220, pipe mating surface shall first be cleaned with the application of Methyl Isobutyl Ketone (MIBK) solvent. This cleaning shall be accomplished by applying MIBK solvent to the full mating surface area and wiping off with a clean cloth, repeating the process, if necessary, until no trace of shine remains (neither streaks nor spots). The use of commercial PVC solvent-cement thinners as a substitute of MIBK is not allowed.

- I. Pressure supply steel pipe and fittings: Assemble using red lead and boiled linseed oil paste or an approved equivalent. Brass and Galvanized threaded fittings shall be assembled with both Teflon tape and oil base compound to male threads only.
- J. Provide concrete thrust blocks or mechanical joint restraints at each change of direction and at all terminal points of all mainline piping as called for on the Plans. Use and install the thrust blocks and joint restraints per the pipe manufacturer's instructions.

3.6 INSTALLATION OF PIPE UNDER EXISTING PAVING:

- A. Piping under existing pavements may be installed by jacking, boring or by hydraulic driving, except as otherwise specified or directed.
- B. All pipes under pavement surface to be installed a minimum of 24 inches below A.C. paving with a 6-inch bedding and a 6-inch cover of sand backfill.
- C. Secure Owner's permission prior to cutting or breaking existing pavements.

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- D. Make completely clean cuts using power saws at approved locations only.
 - E. Replace and restore all surfaces to original condition, including grade, landscaping and paving
 - 1. Restoration work shall match the original work in every respect, including type, strength, texture and finish.
 - 2. Consult with Owner for approved methods of patching and/or replacing any damaged paving sections as a result form boring saw cutting or removal.
- 3.7 INSTALLATION OF PIPE UNDER NEW PAVED AREAS:
- A. Coordinate installation of piping and wires under paved areas with other trades.
 - B. All pipes under pavement surface to be installed a minimum of 24 inches below A.C. paving with a 6-inch bedding and a 6-inch cover of sand backfill.
 - C. If the only piping installed is over 20 feet long, pressure testing is required for that section at the time of installation. Upon completion of piping installation, the entire system must be tested.
 - D. If wire under paved areas cannot be continuous, all splices shall be enclosed in an approved pull box.
- 3.8 ELECTRICAL INSTALLATION FLOW SENSOR:
- A. The sensor leads are supplied with watertight caps over the ends.
 - B. DO NOT remove the plastic caps from the sensor leads until ready to splice. Refer to Manufacturer Application Note 47 and Technical Bulletin 52 @ www.dataindustrial.com
 - C. Use a twisted pair cable suitable for direct burial to connect the sensor to the transmitter, monitor, or controller. Multi-pair telecommunication cable or direct burial cables may be used.
 - D. Make a water tight splice. Two part epoxy type waterproof kits are recommended.
 - E. DO NOT make splices underground unless it is done within a valve box dedicated for spare wires or additiOnal wires.
 - F. Route the cable from the sensor to a Data Industrial flow monitor/ transmitter. The cable may be extended up to 2000 feet, using 2-conductor shielded 20 AWG or larger stranded copper wire with appropriate ratings.
 - G. When connecting to a Data Industrial flow monitor/transmitter, locate the section of terminal strip on the monitor labeled "SENSOR INPUT" or "SENSOR." Connect the red wire to "IN," "SIGNAL (+)" or "SIGNAL" terminal and the black wire to "GND," "SIGNAL (-)," or "COM" terminal and the shield drain wire (if applicable) to "SLD."
- 3.9 ELECTRICAL:
- A. Contractor shall verify power sources shall be as indicated on the drawings.
 - B. The Contractor shall be responsible for making 110 volt electrical connections to the automatic controller and wire circuits from remote control valves to controllers. All electrical work shall be in accordance with all local and /or county ordinances. Wire sizes to be as per manufacturer's specifications.

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3.10 INSTALLATION OF CONTROL WIRE:

- A. Unless otherwise specified, the installation of control wire shall include excavation and backfill, the furnishing, installing and testing of the wires, the removal and/or restoration of existing improvements and all other work in accordance with the plans and specifications.
- B. Unless otherwise specified all neutral (common ground) wire shall be AWG #12 and all pilot (valve control) wire shall be AWG #14.
- C. At least two spare wires shall be installed from the controller clock to the most distant valve. When wire runs go in different directions from the controller clock, a separate spare wire shall be installed from the controller clock to the most distant valve in each different wire run direction. Refer to the Spare Wire locations shown on the drawings.
- D. Tape and bundle all control wires at ten feet (10') o.c. maximum; place wiring with eighteen inch (18") minimum cover. Set wiring at least two inches (2") from adjacent piping when placed in a common trench. Place control wire along side of pipe. Do not place over the pipe.
- E. All wire splicing shall take place in the valve boxes and/or pull boxes. All splices shall be made with a mechanical connector encased in a self-curing epoxy resin that provides a permanent watertight connection. No underground splices will be allowed.
- F. All direct burial control wires shall be identified as to their respective valve number and controller clock letter in all pull boxes and at all wire termination. Spare wires and "future valve" wires, if any, shall also be identified. Labels and tags shall be used for identification which are not affected by moisture or temperatures between minus 30 degrees F. and plus 200 degrees F. The labels and tags shall be resistant to abrasion, dirt, grease, and chemicals used in lawn fertilizers and conditioners. The labels and tags shall be firmly attached to the wire in every case. The Contractor shall submit samples of the labels or tags to be used, to the Architect for recommended approval, prior to the installation of the control wire. Examples of nomenclature of tags or labels are as follows:

Neutral (common ground) wire	= "Neutral" Clock "A"
Pilot (valve control) wire	= "A.V. #1." Clock "A"
Spare Wire	= "Spare" Clock "A"
- G. The final operating sequence of the remote control valves, within each individual controller clock, shall be as called out on drawings.
- H. Testing:
 - 1. All direct burial control wire installed shall be tested in the following manner.
 - a. Before any backfill material is placed over the control wires in the trench, the wires shall be tested with a meter for insulation resistance. Minimum insulation resistance to ground shall be fifty (50) megohms. Any conductor not meeting this requirement shall be replaced.
 - b. After backfill encasement, the wires shall again be tested with a meter. The minimum acceptable insulation resistance to ground on this test shall be one (1) megohm. Any conductor not meeting this requirement shall be replaced.

3.11 PULL BOXES:

- A. Pull boxes shall be installed at intervals not to exceed about two hundred feet and at each location where the installation of the conduit is to be phased, and at each point where the conduit crosses a roadway, bridge, or major utility easement
- B. Pull boxes shall be installed in planted areas whenever possible

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- C. The bottom of box shall be bedded in crushed rock six inches deep and one-half inch of grout prior to installation of the irrigation inter-connects. A layer of 15# roofing paper shall be placed between the grout and the crushed rock. Four one-inch diameter drain hole shall be provided through the center of the pull box grout and roofing paper.
- 3.12 INSTALLATION OF VALVES:
- A. General: Unless otherwise specified, the installation of the valves shall include excavation and backfill, the furnishing, installing and testing of fittings and valves, the furnishing and installing of valve boxes and appurtenances, accessories, the removal and/or restoration of existing improvements and all other work in accordance with the plans and specifications. Fill area under valve box with a minimum of three (3) cubic feet of pea gravel before box is installed.
 - B. Shut-off Valves: Shut-off valves installed underground shall be housed in a suitable valve box. For gate valves 4" and larger, the gate valve hand wheel shall be removed from the stem of all valves installed underground. The wheel shall be replaced with an operating nut.
 - C. Quick Coupling Valves: Unless otherwise indicated, locate valves within twelve inches (12") of hardscape. Install in designated valve box.
 - D. Automatic Control Valves: Automatic control valves shall be set upright and housed in designated valve box, with a hinged, lockable top. The Contractor shall place Christy's Standard Valve Identification tags on each valve corresponding to its appropriate valve station number. Do not place valves baseball/softball field infields or in pedestrian paving and vehicular paving areas.
- 3.13 INSTALLATION OF SPRINKLER HEADS:
- A. Unless otherwise specified, the installation of sprinkler heads shall include excavation and backfill, the furnishing, installing and testing of risers, fittings and heads, the furnishing and installing of cone shaped screens at base of each head, the removal and/or restoration of existing improvements and all other work shall be in accordance with the plans and specifications.
 - C. Flushing: All water lines shall be thoroughly flushed out before heads or drip systems are installed.
 - C. Location and arc of heads shall be adjusted, if required to eliminate any dry spots, over water or spillage on adjacent areas.
 - D. All lawn sprinkler heads to be installed adjacent to existing walks, curbs, or other paved areas, shall be set to the grade of the existing improvements. Sprinkler heads which are to be installed in areas where the turf has not yet been established shall be set two inches (2") above the proposed finished grade. The Contractor prior to final acceptance shall lower heads installed in this manner. In established lawn areas the sprinkler heads shall be set to existing grade.
- 3.14 SWING JOINTS:
- A. Swing-joints will consist of three street elbows plus one Schedule 80 riser of proper length per sprinkler head.
 - B. All street ells for ¾" and larger inlet rotor heads shall be Sch 40 PVC.

3.15 INSTALLATION OF BOOSTER PUMP:

- A. Install Irrigation Booster Pumps in locations as shown on Irrigation Plans and per Detail.
- B. Contact Munroe Systems Field Representatives (Mark DeLange for technical questions and install pump(s) per manufacturer specifications and recommendations. Coordinate all electrical service and power with Electrical Engineer / Contractor prior to installation.
- C. Pump station shall be a completely skid mounted enclosed pump station built by a single manufacturer. All equipment including but not limited to pumps, motors, piping, filters, valves, instrumentation and controls shall be mounted on a common structural base to form a complete operating pumping station. The base of the enclosure shall be mounted on a concrete pad supplied by others, of sufficient size and strength to support pump system.
- D. Station Base. The pump station base shall be designed and fabricated to provide proper structural support for all attached equipment. The base shall supply sufficient rigidity to withstand the stresses of reasonable and competent transportation to site, off-loading, installation, and operation. Pump station base shall be manufactured of marine grade aluminum alloy 5052-H32.
- E. Piping. Pump inlet and discharge piping shall be constructed from schedule 40, ASTM A120, ASTM A53, or API 5L steel pipe or heavier. Piping between the pump, the valves and the pressure manifold shall be roll grooved to provide maximum flexibility and expansion and minimum vibration. A cut groove is not acceptable. All piping shall be sized so that at no point in the performance rating of the system shall velocity exceed 13 feet per second. The station should be designed so that the average velocity shall be less than 10.0 feet per second. All piping will be electro static zinc plated for corrosion resistance.
- F. Fan-A fan shall be mounted in the enclosure. The purpose of the fan is to exhaust heat that the motor produces. This fan shall have molded polycarbonate fan blades and a motor with unit bearing, impedance protected, and mounted in a cast zinc venturi. There shall be guards on both sides of the fan and a screen on the fan discharge to protect against rodent entry. This fan shall exchange the air inside the enclosure at a rate that will keep the temperature inside the pump station enclosure 10 degrees or less above ambient.
- G. Bolts- All bolts used in the assembly of the pumping system shall be uni-chrome plated to retard corrosion. The bolts shall meet SAE J429 Grade 5 and ASTM A449 specifications.

3.16 THRUST BLOCKS:

- A. Thrust blocks shall be concrete 2000 psi at 28 days. They shall be placed so that sides subject to thrust or load are against undisturbed earth, and valves and fittings are serviceable after concrete has set.

3.17 RECORD DRAWINGS:

- A. The Contractor shall provide and keep up to date, a complete record set of bond prints which shall be corrected daily and show every change from the original Drawings and Specifications and the exact locations, sizes and kinds of equipment. Prints for this purpose may be obtained from the Owner. This set of Drawings shall be kept on the site and shall be used only as a record set. Architect shall review drawings prior to any planting.

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- B. In order to complete the record Drawings in a neat, legible manner, the contractor shall indicate the necessary changes on bond tracings procured from the Owner/Landscape Architect.
 - C. The contractor shall dimension from two (2) permanent points of reference, building corners, sidewalks, etc., the location of the following items:
 - 1. Point of connection (referenced from known existing elements to remain).
 - 2. Connection to electrical power.
 - 3. The routing of the sprinkler main lines. (Dimension every one hundred feet [100'] maximum and at change in direction).
 - 4. Routing of control wiring by valve number and location of existing and new controller
 - 5. Shut-off valves.
 - 6. Control valves.
 - 7. Quick coupling valves.
 - 8. Show where sleeves are installed under paving and concrete.
 - 9. Pull boxes / wire splice boxes.
 - 10. Spare wire locations.
 - 11. Any other pertinent underground item, if so deemed by the Landscape Architect.
 - D. On or before the date of the final inspection, deliver the completed record drawings to the Architect. Delivery of the record drawings will not relieve the Contractor of the responsibility of furnishing additional information that may have been omitted from the original record drawings.
- 3.18 EQUIPMENT TO BE FURNISHED:
- A. Six (6) operator and service manuals and information pages for all equipment used shall be furnished to the Owner. Manuals may be loose leaf and should show drawings or exploded views of equipment and catalog number. Operating instructions for all equipment shall be furnished.
 - B. Provide a hand held wireless remote control unit (ONE PER EACH SITE.)
- 3.19 GUARANTEE
- A. The entire irrigation control system shall be guaranteed by the Contractor as to material and workmanship, for a period of one year following the date of final acceptance of the work
 - B. Should any operational difficulties in connection with the irrigation control system develop within the specified guarantee period, which in the opinion of the Owner may be due to inferior material and/or workmanship, said difficulties shall be immediately corrected by the Contractor to the satisfaction of the Owner, at no additional cost.
 - C. Notes and any other manufacturer-guarantees required in other articles of this specification. Provide Owner with original copy of all guarantees required.
- 3.20 CONTROLLER CHARTS:
- A. Prior to the date of the final acceptance of the project, at the end of the Landscape Maintenance period, the Contractor shall acquire from the architect a CAD file and or print(s) at the Contractor's expense and record from the jobsite record set all changes made during construction and label as "Record Drawings" Do not prepare charts until record Drawings have been approved by the Owner's representative.

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- B. Provide in controller chart for each automatic controller installed.
 - 1. Chart may be a reproduction of the record drawing if the scale permits fitting the controller door. If photo reduction prints are required, keep reduction to maximum size possible to retain full legibility.
 - 2. Chart shall be black-line print of the actual system, showing the area covered by that controller.
- C. Identify the area of coverage of each remote control valve, using a distinctly different pastel color, drawn over the entire area of coverage.
- D. Following approval of charts by Owner's representative, they shall be hermetically sealed between two layers of 20-mil thick plastic sheet.
- E. Charts must be completed and approved prior to final review of irrigation system.

3.21 TESTS:

- A. Pressure Tests:
 - 1. All pressure lines shall be tested under hydrostatic pressure of 150 pounds per square inch, and all non-pressure lines shall be tested under the existing static pressure and both are proved watertight. Contractor shall provide all equipment for hydrostatic tests at no cost to the Owner.
 - 2. Pressure shall be sustained in the lines for not less than two (2) hours. If leaks develop, the joints shall be replaced and the test repeated until the entire system is proved watertight.
 - 3. Tests shall be observed and recommended for approval by the I.O.R (Inspector of Record/and or owners field superintendent prior to backfill.
- B. Coverage Test:
 - 1. When the irrigation system is completed, the Contractor, in the presence of the Landscape Architect, shall perform test coverage of water afforded the planting areas, complete and adequate. The Contractor shall furnish all materials and perform all work required to correct any inadequacies of coverage disclosed arising from his work.
 - 2. Contractor shall inform the Owner's representative of any deviation from the plan required due to wind, planting, soil or site conditions that bear on proper coverage; and upon approval, perform changes to provide for proper coverage at no additional cost to Owner.
- C. The Contractor shall cause the following tests to be performed by equipment supplier on all electrical circuits and system components, and shall submit a written approval from the equipment supplier to the Architect prior to the start of the establishment period.
 - 1. Each circuit shall be labeled and tested for continuity.
 - 2. Each circuit shall be tested for leaks to ground with an ohm meter after each inter-connects circuit have been installed and connections have been made. No circuit checking lower than 1 mega-ohm will be acceptable
 - 3. The grounding system shall be tested with a meter and shall not measure more than 15 ohms.
 - 4. A functional test shall be made in which it is demonstrated that each and every part of the system functions as specified or intended. The test may commence only with the approval of the Architect.
 - 5. The functional test for each new or modified electrical system shall consist of not less than five days of continuous, satisfactory operation. If unsatisfactory performance of the system develops, the condition shall be corrected and the test shall be repeated until the five days of continuous satisfactory operation are obtained.

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6. Starting of functional tests and turn-on shall not be made on a Thursday or on the day preceding a legal holiday. Shutdown caused by factors beyond the Contractor's control shall not constitute discontinuity of the functional test.
7. Any material revealed by these tests to be faulty in part of the installation shall be replaced or corrected by the Contractor at his/her expense in a manner permitted by the Architect. The same test(s) shall be repeated until no fault is evident.
8. Results of circuitry tests shall be recorded and submitted to the Architect prior to acceptance of work.

3.22 REVIEWS:

- A. Normal Progress Reviews: Normal progress reviews shall be requested from the Architect at least forty-eight (48) hours in advance of any anticipated review. The Landscape Architect on each of the steps listed below will make a review. The Contractor will not be permitted to initiate the succeeding steps of work until he has received written approval to proceed by the inspector.
 1. Immediately prior to the commencement of the work of the Section.
 2. Pressure supply line installation, trenching and testing.
 3. System layout.
 4. After placement of all heads, valves and controllers for coverage test.
 5. Final review and receipt of "Record Drawings" and "Controller Charts."
 6. Final acceptance of project by Owner.
- B. In no event shall the Contractor cover up or otherwise remove from view any work under this contract without prior approval. The Contractor, at his expense, shall open any work covered prior to review to view.
- C. Unprepared Review Requests: In the event the Contractor requests review of work and said work is incomplete, the Contractor shall be responsible for review cost.
- D. Completion: The work will be accepted, in writing, when the whole system shall have been completed satisfactorily to the Owner. In judging the work, no allowance for deviation from the original plans and specifications will be made unless already approved by the Owner, in writing, at the proper times.
 1. Leave the entire installation in complete operating order, free from any and all defects in material, workmanship or finish, regardless of any discrepancies and/or omissions in plans or specifications.
 2. Remove from the site all debris and rubbish resulting from the work, and leave the installation in clean condition.

3.23 MAINTENANCE:

- A. Maintenance of irrigation system prior to job completion, and during the Landscape Maintenance period, shall be the responsibility of the Contractor including, but not limited to, the following:
 1. Cleaning of plugged irrigation heads.
 2. Irrigation heads adjustments. The Contractor shall check all systems for proper operation a minimum of once a month. Lateral lines shall be flushed out after removing the last sprinkler head or at two at each end of the lateral as deemed necessary. All heads are to be adjusted as necessary for optimum head to head coverage.
 3. Volume of water being applied. (Coordinate with landscape maintenance).
 4. Programming of the controller. (Coordinate with landscape maintenance). Set program automatic controllers for seasonal water requirements. The Contractor shall adjust his watering schedule equal to the application rate each area is capable of receiving based upon topography, soil type, plant material, season, available E.T data and weather. The Contractor shall provide the owner with a key to controllers and instructions on how to turn off the system in case of emergency.

5. Repairing leaking valves, etc.
6. Any other problem areas, which occur after installation, attributed to the irrigation system.
7. Repair or replace equipment due to acts of vandalism, theft or pest damage. Repairs shall be made within one watering cycle. All replaced equipment shall match equipment specified on the plans and within these specifications.
8. Lower all turf heads to final grades prior to final acceptance by Owner.

END OF SECTION

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. It shall be the responsibility of the successful turf contractor to provide all surveying, layout, staking, labor, materials, equipment and tools necessary for the complete installation of a vertically draining porous stone base, drainage system and perimeter edge attachment detail. The scope of the project shall consist of but not necessarily be limited to the following:
1. A vertically draining porous aggregate base consisting of two layers of specifically sized stone. The finishing layer is specifically designed to provide a tight uniform finish surface over the base layer without settlement.
 2. A water evacuation system consisting of panel drains in a herringbone design with a properly sized perimeter drain connected to an existing storm system.
 3. An appropriately designed perimeter edge detail of recycled plastic, treated wood or concrete.

1.02 QUALIFICATIONS AND SUBMITTALS

- A. The Bidding entity shall meet the following experience criteria:
1. The Bidder must have installed at least five porous stone base and drainage systems.
 2. All Bidders shall submit, with the bid, resumes of the Project Manager that will be utilized on the project.
 3. All Bidders shall submit, with the bid, a list of 25 completed installations of vertically draining porous stone base and drainage systems completed in the last five years. The list shall include names and phone numbers of the contacts.
 4. The Bidder shall provide evidence of a bonding capacity of no less than 10 million dollars from a best-rated surety.
- B. The Bidder shall submit the follow with the bid/proposal:
1. Submit detailed specifications and other descriptive literature, as may be required, to insure the Owner is clear on the scope of the installation and the specific product proposed. Items such as cross-sections, edge detail, seaming plan, inlay and striping plan, drainage plan and proposed slopes may be necessary.
- C. The Bidder shall supply a Warranty on the vertically draining stone base and drainage system that guarantees the usability and specifically states that the installed system is suitable for its intended purpose.
1. The Warranty period shall be one year from the date of substantial completion.

PART 2 - MATERIALS

2.01 GEOTEXTILE MEMBRANE

- A. Provide a semi-pervious geotextile fabric, Mirafi 140 N or equal. An impervious liner can also be used in certain soil conditions.

2.02 STONE AGGREGATE

- A. The stone shall be installed in two layers:
1. 5" Open Graded Stone (OGS) base aggregate.
 2. 1" finish aggregate. The aggregate shall conform to the following:

	BASE (OGS)	FINISH
Sieve size	%PASSING	%PASSING
* 1.24"	100	
* 3/4"	70-100	
* 3/8"	35-50	
* 1/4"		100
* 1/8"		80-100
* #4	20-35	
* #8		40-65
* #16	12-20	15-35
#100	2-7	2-7
#200	0-5	0-5

2.03 DRAINAGE PIPING

- A. Panel drains - 1" x 12" Multiflow™ or approved equal.
- B. Perimeter drain (perforated) - properly sized to 8" to 12" diameter, of HDPE, ADS N-12 or equal.

PART 3 - EXECUTIONS

3.01 EXCAVATION AND SUBGRADE PREPARATION

- A. In accordance with the plans approved by the Owner, the entire area shall be excavated. It shall be the Bidders responsibility to stockpile enough suitable material from the existing topsoil to be reused, as necessary, in the restoration process.
- B. All other excavated material shall be properly disposed of, off site or a designated area by owner. The Bidder shall provide the Owner with a cubic yard number for the removal and replacement, with suitable compactable material, of unclassified material.

- C. The sub grade shall slope .5% toward the perimeter drain and shall not vary more than 1/2" in any 10' direction. The entire excavated area shall be proof rolled to check for any soft spots or un-compacted areas. The sub grade shall test and must achieve a minimum of 98% compaction of a standard proctor.
- D. The geotextile fabric shall be installed over a compacted and prepared sub grade. Seams shall be overlapped a minimum of 12". The geotextile shall extend into and completely wrap the perimeter drainage ditch.

3.02 DRAINAGE SYSTEM

- A. Multiflow™ 1" x 12" panel drains shall be installed and secured over the geotextile, 15' to 30' on center (project specific), diagonally across the playing field in a herringbone design. The drains shall be terminated at the perimeter drain.
- B. A properly sized perimeter drain, 8" to 12" in diameter, shall be installed in a properly excavated ditch, lined with geotextile. The CPPP (corrugated perforated plastic pipe) shall be sloped .05" per lineal foot toward the exit point to the existing storm drain.
- C. One or more 2' x 2' catch basins may be installed at directional changes in the line, at the depth necessary to meet the elevation of the existing storm water evacuation line.

3.03 VERTICALLY DRAINING POROUS STONE BASE

- A. The base (OGS) aggregate layer shall be installed with care to avoid damaging the geotextile or the strip drains. The stone shall conform to the sieve in Section 2.02, A. The base (OGS) layer shall be 5" thick. The surface planarity shall not vary more than 3/8" in any 10' direction.
- B. The finish aggregate layer is 1" thick and shall be installed in a single layer. The stone shall conform to the sieve in Section 2.02, A. The surface planarity must not vary more than 1/4" in any 10' direction. Enough finish stone shall be installed to insure a full 1" above the base (OGS) aggregate. All stone layers must be rolled in both directions to obtain maximum compaction and settlement.

* Denotes a characteristic that may fluctuate depending on the type of material available.

** Please note that the above specification is Sprinturf's recommended base and drainage specification and is intended as a guide for project Architects and Engineers. Some deviations may be acceptable for successful base and drainage construction upon consultation with Sprinturf Representative in order to ensure Sprinturf acceptance and full warranty.

END OF SECTION

SECTION 32 85 20 –ARTIFICIAL TURF

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. General: comply with all of the Contract Documents.
- B. Work Included:
 - 1. Includes furnishing of all labor, materials, and equipment required for artificial turf surfacing, including vertically draining porous stone, aggregate base, vapor barrier, drainage, striping and line markings.
- C. Related Sections: The following sections are noted as containing requirements that relate to this section, but may not be limited to these listings:
 - 1. Section 31 10 00 – Site Clearing
 - 2. Section 31 20 00 – Earth Moving
 - 3. Section 33 41 00 – Storm Utility Drainage Piping

1.03 ACCEPTABLE MANUFACTURER AND INSTALLER

- A. Sprinturf - An ITS Company. Product is the Basis of Design (Board Adopted Standard 2011) 660 American Avenue, Suite 101
King of Prussia, PA 19406
1-877-686-8873 www.sprinturf.com

1.04 SCOPE OF WORK

- A. Furnish all labor, materials, tools and equipment necessary to install, in place, all artificial turf materials as indicated on the plans and as specified herein. The installation of all new materials shall be performed in strict accordance with the manufacturer's written installation instruction, and in accordance with all approved shop drawings.
- B. Prior to order of materials, the artificial turf contractor shall submit the following:
 - 1. Product data including independent test lab results.
 - 2. Installation details
 - 3. Sample warranty
 - 4. Field layout and striping plan
 - 5. Color samples
 - 6. Details on construction, especially any details that may deviate from plans and specifications.

- C. Prior to the beginning of installation, the manufacturer/installer of the artificial turf shall inspect the sub base and supply a Certificate of Subbase Acceptance for the purpose of obtaining a manufacturer's warranty for the finished artificial playing surface.
- D. Prior to final acceptance, Contractor shall submit to the District three (3) copies of the maintenance manuals, which include necessary instructions for the proper care and preventative maintenance of the artificial turf system, including painting and striping.

1.05 SHOP DRAWINGS

- A. Shop drawings shall be prepared at the scale of the construction documents and contain all pertinent information regarding installation. These drawings shall be submitted to the District for approval prior to the manufacturing and shipment of materials.
- B. Submit drawings for:
 - 1. Installation details, edge details, other inserts and covers, etc.
 - 2. Striping plan, layouts showing any field lines, markings and boundaries, and field logos per project drawings.

1.06 DESCRIPTION

- A. These specifications relate to general areas for the Sports Surfacing Systems, which must be completed for proper installation of materials furnished by Sprinturf.
- B. The furnishings of material and/or complete installation of the Sport Surfacing System including: vertically draining porous stone, aggregate base, drainage system, material layout, seaming of material, marking of sports surface, installation of any impregnated layer, trimming of materials and edge attachment are included in the Sports Surfacing Systems scope of work.
- C. Permeable Aggregate Bases: The General Contractor shall furnish and install the aggregate base depressing the base sufficiently to accommodate the Sports Surfacing System. The base shall be laser graded and compacted smooth to a tolerance of 1/4" in any 10' radius by the General Contractor. High spots shall be graded level, and low spots filled in with additional material and sufficiently compacted to be uniform with the entire base by the General Contractor to the full approval of Sprinturf or an authorized installer of Sprinturf.

1.07 STANDARD EQUIPMENT AND GAME INSERTS

- A. Standard inserts are to be provided by Sprinturf or approved by Sprinturf prior to installation. Standard inserts are to be installed by the General Contractor to Sprinturf specifications. Standard inserts are to be elevated or depressed based on the Sports Surface System being utilized. All standard inserts must be installed using a suitable size foundation and are to have adequate drainage from the depth of the insert.

1.08 THRESHOLDS

- A. The General Contractor and District Representative are jointly to identify all areas of egress from and to the Sports Surface System. These threshold locations are to be depressed to allow a level smooth and clean transition between surrounding surfaces and the Sports Surfacing System as provided by Sprinturf.

1.09 QUALITY ASSURANCE

- A. Manufacturer: Manufacturer of the Sports Surfacing System shall be a firm specializing and experienced in manufacturing products specified in this section. The manufacturer must have been in business for a minimum of 10 years and under the same ownership, and/or in business equal or more years than the warranty offered on the product, which ever is greater.
- B. Installer: The complete installation of the Sports Surfacing System, as described in the scope of these specifications and herein, shall be carried out by Sprinturf or a Sprinturf authorized installer.
- C. Performance Testing: The Sports Surfacing System shall have been independently tested and evaluated for athletic performance according to American Standard Testing Methods (ASTM).
- D. The artificial turf installer/manufacturer shall have the experience of at least twenty (20) acceptable installations of full-size football or soccer fields (minimum of 70,000 s.f.) in the United States within the past five (5) years of tufted, slit film polyethylene grass-like fabric that are infilled with SBR rubber or a layered system of 30% sand and 70% rubber. Provide this listing with the bid.
- E. The turf contractor shall employ only qualified, experienced supervisors and technicians skilled in the installation of the specified system.
- F. The turf contractor shall meet the following criteria:
 - 1. Possess an active Class A California Engineering license in good standing, and have never had a license revoked.
 - 2. Have not had a surety or bonding company finish work on any contract within the last five (5) years.
 - 3. Have not been disqualified or barred from performing work for any public District or other contracting entity.
- G. The average G-max of the finished system shall be as follows:
 - 1. All rubber: Under 150 G's for the life of the warranty.
 - 2. Sand and rubber: Under 175 G's for the life of the warranty.

1.10 FIELD QUALITY CONTROL

- A. Prior to installation, during installation, or at completion of installation of the artificial surfacing, if there is any question or doubt about the quality of formulation of the material, the product shall be tested. Any material failing to meet specifications will be replaced with new material at Contractor's expense.
- B. The Contractor shall, with the presence of the District, inspect the field surfacing each year until the end of the eight (8) year warranty period, or at any time requested by the District. Any defects in workmanship or materials (at no fault of the District) shall be repaired at the expense of the Contractor to the satisfaction of the District.

1.11 SUBMITTALS

- A. Product Data
 - 1. Standard printed specifications of the artificial surfacing system that is being installed.
 - 2. Installation process and requirement for permeable aggregate base and any conditions that may limit the artificial surface installation or affect quality of installation.
 - 3. Submit manufacturer's product specifications and installation instructions for each track and field equipment item.
- B. Submit an affidavit attesting that the surfacing material to be installed meets the requirements defined in the manufacturers currently published specifications and any modifications outlined in these technical specifications prior to the commencement of work.
- C. Specification Sheets: Submit Sprinturf specification sheets.
- D. Samples: Submit one sample of specified Sports Surfacing System, if requested by Architect. Color sample may fluctuate slightly based on normal manufacturing tolerances. Artificial Surfacing and Color: Submit a products sample 12" x 12" in size, the same color, texture, thickness, etc. of the same type of surfacing to be installed for this project. This must be a representative sample of the product. This sample must be submitted and approved by the District, prior to installation. At completion of the project this sample shall be used to judge the quality of the installed product.
- E. Maintenance Literature: Upon completion of the Sports Surfacing System installation, and execution of the Workmanship Satisfactory Acceptance Certificate, Sprinturf will send to the District, attendants or individuals in charge and responsible for the upkeep of the surface a care card. This care card spells out care and maintenance instructions.

- F. Shop Drawings: Submit plans, elevations, sections and details of custom-fabricated units and of assembled units made up of manufactured equipment. Show required substructures by size and location. Connections to structural elements shall be completely detailed. Submit a diagram/drawing depicting and identifying all line markings:
 - 1. A key to the color codes
 - 2. A chart for all symbols
 - 3. Labels for all events.

- G. Warranty Certificate: Upon completion of the Sports Surfacing System installation, and execution of the Workmanship Satisfactory Acceptance Certificate, Sprinturf will send to the District, attendants or individuals in charge and responsible for the upkeep of the surface a Warranty Certificate.

1.12 EXISTING CONDITIONS

- A. If the surface on which the new artificial turf system is to be placed is a new base of porous aggregate, the Artificial Turf Contractor will be responsible for any damage to the sub base during installation of the artificial turf system after the deficiencies (if any) have been corrected as noted on the Certificate of Subbase Acceptability.

1.13 SCHEDULE

- A. Turf Contractor shall complete all work on the artificial turf system in accordance with the published project schedule.

1.14 SURFACE AREA

- A. The contractor is to verify all measurements.

1.15 UTILITIES

- A. General Contractor will supply necessary water, adequate lighting and electricity for installation.

1.16 WORKING CONDITIONS

- A. Preparation Work
 - 1. Outdoor Preparation Work: The Sports Surfacing System specified herein shall not be installed until all underground work, drainage, access and other work requiring access onto or over the Sports Surfacing System area has been complete. The trim and/or edge materials must be completed prior to the start of the Sports Surfacing System and ready to receive the Sports Surfacing System.

- B. Vertically Draining Permeable Aggregate Base: The base must be completed and approved by Sprinturf prior to the start of the Sports Surfacing System installation.

- C. Access: The installation of the Sports Surfacing System shall not begin until all sub-contract work, which would cause damage, dirt, dust or interruption of normal installation pace is complete. The General Contractor is to provide proper access to the area to be surfaced.

1.17 WARRANTY

- A. Materials: The materials shall be under warranty for a period of eight (8) years, unless otherwise stated on the Warranty Certificate, and further as described in the Warranty Certificate.
- B. Installation: The installation shall be under warranty for a period of eight years, unless otherwise stated on the Warranty Certificate, and further as described in the Warranty Certificate.
- C. Certificate: The Warranty Certificate is the final expression of warranty for the product sold. The foregoing warranty is in lieu of and excludes all other warranties not expressly set forth herein, whether express or implied, including, but not limited to any implied warranties of merchantability of fitness.
- D. The contractor shall submit its Manufacturer's Warranty which guarantees the usability and layability of the artificial turf system for its intended uses for an eight (8) year period commencing with the date of Substantial Completion.
 - 1. The warranty submitted must have the following characteristics:
 - a. Must provide coverage for eight (8) years from the date of Substantial Completion.
 - b. Must warrant materials and workmanship.
 - c. Must warrant that the materials installed meet or exceed the product specifications.
 - d. Must have a provision or make a cash refund or repair or replace such portions of the installed materials that are no longer serviceable to maintain a serviceable and playable surface.
 - e. Must be a manufacturer's warranty from a single source covering workmanship and all self-manufactured or procured materials.
 - f. Must provide a third party insured or bonded warranty.
 - g. The average G-max of the finished system is as follows:
 - 1. All rubber: Under 150 G's for the life of the warranty.
 - 2. Sand and rubber: Under 175 G's for the life of the warranty.

In order to maintain the G-max, the Owner shall be required to maintain the synthetic grass by following the recommended maintenance and grooming procedures contained in the Sprinturf Maintenance Manual, provided to the Owner.

1.18 QUALITY ASSURANCE

A. Qualifications (Equipment)

1. Equipment in this section that is furnished by the Contractor shall be installed under the direct supervision of an authorized representative, or in strict compliance with printed instructions of the manufacturer of the equipment. Installer shall have successfully completed twenty (20) installations similar to that specified in this section.
2. Where indicated, units of equipment require shop/field custom fabrication, provide units fabricated and installed by shops which are skilled and which have a minimum of five (5) years experience in similar work.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Adhesive

1. HGS Adhesive – HGS is specified for all removable systems and Velcro adhesive, HGS, one-component adhesives are to be utilized in the completion of this Sports Surfacing System. One-Component adhesives provide a consistent chemical mixture and guarantee a professional bond. The GHS adhesive is to be a high green strength, high solids, and curing urethane adhesive. The adhesive is to be water resistant and must have minimum peel strength of 40 lbs per inch wide at 75 degrees Fahrenheit. The adhesive is to be applied utilizing a model 7400 Graco sprayer with appropriate nozzle.
2. EC847 Adhesive – EC847 is the one component nitrile rubber based adhesive that is to be utilized in the completion of this Sports Surfacing System. One-component adhesives provide a consistent chemical mixture and guarantee a professional bond. The adhesive is to be water resistant and must have minimum peel strength of 40 lbs per inch wide at 75 degrees Fahrenheit. The adhesive is to be applied manually utilizing a 3/16" notched trowel. The adhesive is to have a bonding range up to 15 minutes and must be heat resistant (uncured) to 160 degrees Fahrenheit.

- #### B. Seaming Tape: Codura seaming tape is to be constructed of high tenacity, urethane coated, woven nylon. The manufacturer is Dupont. The Denier is to be a minimum of 500 by 1000. The Cordura seaming tape is to have a minimum of 2 oz. Urethane water resistance layer applied to its underside during manufacturing.

C. Sports Surface (Sprinturf Ultrablade MM™)

1. Yarn – Polyethylene Mono-Spinneret 11,000 Denier, Mono-Tape 8000 Denier
2. Pile Fiber Weight – 44 oz/YD²
3. Primary Backing – Stabilon™ (Triple Backing) – 8.7 oz/YD²
4. Secondary Backing – Polyurethane – 22 oz/YD²

5. Tufting – Gauge 3/8" – StitchRate 10/3" – Pile Height 2.25"
 6. Total Product Weight – 77 oz/ YD²
 7. Colors – Green fiber blend. (Final color per District direction)
- D. Impregnated Layer – Rubber & Sand Mixture: The impregnated layer specified for this Sports Surfacing System must be 70% granulated rubber from tires and 30% kiln dried sand. Granulated Rubber: The granulated rubber is to be free of metal and fiber. The mesh size of the granulated rubber must be 14/30. The kiln-dried sand mixed in the impregnated layer specified for this Sports Surfacing System must be 100% kiln dried sand. The kiln-dried sand must be clean, dry, rounded silica sand. The mesh size of the kiln-dried sand used in the impregnated layer is completed with a mixture of 70% granulated rubber and 30% kiln dried sand. This mixture must be combined and mixed prior to application, using a professional method, to ensure consistency and uniformity. The mixture must then be spread in such a manner to ensure the authenticity of the mixture.
- E. In-Laid Line and Marking System: This Sports Surfacing System has been specified to have an in-laid line marking systems for optimum performance. In-laid line and marking systems are to be created using the same material specifications and are to be inset in such a manner to ensure a good bond, an even finished surface and physical strength equal to the material prior to introduction of the line and marking system.
- F. Trim and Edge (Per Plan Details)
1. Header Boards: Black Rhino Recycling Solid Structural Composite Wood as designated.
 2. Field Edge Trim – Ramping: A pre-cast field edge trim ramping is utilized to transition from the existing base to the Sports Surfacing Surface. The field edge trim is produced in 96" by 12" strips. This field edge trim ramping is to be constructed utilizing the highest grade Ethylene Propylene Diene Monomer Rubber material and a UV stabilizer with a minimum of five (5) years. Custom thicknesses are available, ranging from 0.6" to 4" (15-100 mm). These field edge trim ramps have shock attenuation (ASTM F1292) Gmax less than 200, head injury criteria less than 1000. The tensile strength (ASTM D412) is to be 60 PSI (413 Kpa). The tear strength (ASTM D624) is to be 140 lbs per inch. The field edge trim ramping is to have good water permeability. The elasticity layer must bypass ASTM D 2859 standard test method for flammability of finished textile floor covering materials. The field edge trim ramping is precast and can be applied over concrete or asphalt sub floors that are level and uniformly sloped since variations in grade will be accentuated by the trim. The field edge trim ramping is fastened using Tapcon fasteners.
 3. Vinyl Edge Guards: The vinyl edge guard that has been specified for this Sports Surfacing System is Johnsonite. Johnsonite vinyl transitions, reducers, adapters and edge guards are available in various colors and for various applications. Vinyl edge guards are fastened using Tapcon fasteners.

- H. Fasteners
1. Tapcon: 3" Tapcon fasteners are required to fasten the vinyl edge guard pursuant to manufacturer's recommendations (4" o.c. unless noted otherwise).
 2. Staples: The staples for Sports Surfacing Systems are industrial strength pursuant to manufacturer's recommendations.
- I. Materials shall be tufted, slit film polyethylene grass-like fabric coated with a secondary backing of high-grade polyurethane. The fibers shall be tufted to a finished pile height of approximately 55 mm. The turf fabric shall be filled with a layered system of 30% silica or fractured sand and 70% ambient rubber.
- J. All components and their installation method shall allow for use on outdoor athletic fields. The materials as hereinafter specified, shall withstand full climatic exposure in all climates, be resistant to insect infestation, rot, fungus and mildew; to ultra-violet light and heat degradation, and shall have the basic characteristic of low through-drainage allowing free movement of surface run-off through the turf fabric where such water may flow to the existing sub base and into the field drainage system.
- K. The finished playing surface shall appear as mowed grass with no irregularities.
- L. Pile yarn (polyethylene) shall be a proven athletic caliber yarn designed specifically for outdoor use and stabilized to resist the effect of ultraviolet degradation, heat, foot traffic, water and airborne pollutants. The pile fiber shall possess the following physical characteristics:
1. Yarn Denier Mono-Spinneret 11,000 Denier, Mono-Tape 8000 Denier **
 2. PE Pile fiber Weight 44 ounces per sq. yd.**
- **Pile yarn characteristics nominal +/- 5%
- M. The pile fabric shall possess the following physical characteristics:
1. Finished Pile Height 2.25 inches**
 2. Pile Yarn Thickness 235 microns (Spinneret)
115 microns (Mono-Tape)
 3. Primary Backings 8.7 ounces per sq. yd.**
 4. Secondary Backing 22 ounces per sq. yd.**
 5. Tuft Gauge 3/8"
 6. Tuft Bind Strength >10 pounds force
- N. Infill material shall be layered system of silica or fractured sand and ambient rubber consisting of no more than 30% sand and 70% rubber in accordance with the manufacturer's recommendations and the District's preference.
- O. Perimeter and interior edge details, underground storm sewer piping and connections, required for the system are detailed on the plans.

PART 3 - EXECUTION

3.01 GENERAL

- A. The installation shall be performed in full compliance with approved shop drawings.
- B. Only factory-trained technicians, skilled in the installation of athletic caliber artificial turf systems working under the direct supervision of the artificial turf manufacturer's installation supervisor shall undertake the placement of the system. Ready for the installation of the artificial turf system and must be perfectly clean as installation commences and shall be maintained in that condition throughout the process.

3.02 EXCAVATION

- A. A single benchmark shall be established prior to any excavation and maintained by a licensed surveyor of record during the entire construction process. The sub-grade under the permeable aggregate base shall be prepared according to Specification Section 02200 Earthwork and Grading.
- B. The subgrade shall be constructed using approved select-fill material. This material shall be placed in lifts not greater than 6" in depth. Each lift (layer or course) shall be compacted separately. The moisture in the soil, at the time of compaction, shall be uniformly distributed and should be within 90 and 120% range of the optimum. Within these limits, the geotechnical engineer will determine the proper moisture level to be used, by standard proctor. (*)

(*) ASTM Test Method D698

- C. The select-fill material in the first layer shall be rolled until the course has been uniformly compacted to a minimum 95% of the maximum density. The second and succeeding courses shall be placed and mixed and then compacted as specified in the first course.
- D. The finished surface of the subgrade shall have a finished grade in accordance with the Plans and Specifications. The subgrade shall be established to within a tolerance of +/- 1/2" of the designed subgrade elevation.
- E. Excavate perimeter drainage collector trenches per the detailed plans and at a minimum of 18" wide and 20" deep. The trenches should be excavated with a minimum of 0.5% slope starting from the high point of the drainage system extending toward the storm drain connection outlet point(s). Design of the collector trenches should incorporate the following:

1. All loose debris shall be removed from the trenches.
2. The trenches shall then be compacted by hand tamping (or equivalent machinery) to a minimum 95% of the maximum density. (**)

(**) ASTM Test Method D698

3.03 UNDER DRAIN SYSTEM

Impermeable Liner – Entire Sports Field Area

- A. Verify surface elevations of the finished subgrade. The surface elevations must conform to the elevations shown on the drawings.
- B. Prior to under drain system construction, the subgrade surface is to be uniform and free of manufacturer's written recommendations. Liner shall be UV resistant and shall have the following minimum properties:

PROPERTY REQUIREMENTS	TEST METHOD	
Appearance		Black/White
Nominal Thickness		12 mm
Weight per 1,000 sq ft		42 lb
Tensile Strength	ASTM D751-88	10,000 psi
% Elongation		40%
Grab Tensile	ASTM D751-89	220 lbs
Tongue Tear	ASTM D751-89	62 lbs
Trapezoid Tear	ASTM D751-89	37 lbs
Hydrostatic Bursting Point	ASTM D751-89	123 lbs
Mullen Burst	ASTM D751-89	250 lbs
Puncture	FTMS 101 C (Method 2065)	73 lbs
Dimension Stability	ASTM D1204	+/-3%

1. The liner should be placed in the perimeter trench first. The trench liner should be separate from the liner on the field. Overlap field and trench sections a minimum of 18" in the direction of water flow
2. Overlap joints a minimum of eight inches. All laps shall be overlapped in direction of water flow.
3. Place a suitable amount of ballast on the liner to prevent movement by wind. The ballast shall be in a form which will not damage liner.
4. Direct loading on the fabric by traffic shall not be allowed. A minimum of 6" of material cover must be placed prior to traffic.
5. Punctured or torn fabric shall be repaired by overlapping additional fabric and jointing in accordance with manufacturer's recommendations.
6. The liner must completely line the perimeter trench in a continuous manner.

3.04 PERIMETER COLLECTION DRAINS

A. Place all under drainpipes in the perimeter collector trenches per Civil Drawings and Details. The centerline of the pipe shall coincide with the centerline of trench. The pipes shall be per drainage specification section 02720 and capable of withstanding the anticipated loading without deformation.

Note: See Civil Engineering Plans for layout and elevation.

1. A minimum of 2" of 1-1/2" diameter (minimum) clean, drainable crushed stone aggregate shall be placed in the bottom of the collector trenches, on top of the moisture barrier. The crushed stone aggregate should be compacted suitably.
2. Place a minimum of 4" of 1-1/2" diameter (minimum) clean, crushed stone aggregate on the sides of the under drain pipes and headers, and 6" minimum of the aggregate on top of the pipe network. Compact suitably.

B. Refer to Section 02860 – Sports Field Equipment.

3.05 AGGREGATE LAYER

A. Aggregate or aggregate blends acceptable as a processed stone drainage course shall conform to the following gradation:

Sieve	Sieve Sizes Metric (mm)	Percent Passing by Weight
1-1/2"	38.1	100
1"	25.4	95 – 100
3/4"	19.0	80-100
1/2"	12.7	60 – 80
3/8"	9.52	30 – 50
No. 4	4.75	20 – 40
No. 8	2.38	10 – 30
No. 40	0.42	5 – 17
No. 200	75 mm	1 - 4

Aggregate acceptable for Top Stone binder/leveler shall meet the following gradation criteria:

The permeable base shall be two layers of crushed stone, a base stone of a minimum of 4" and a top stone of 2", which meet the following gradation criteria:

% PASSING

<u>Sieves</u>	<u>Base Stone Type 1*</u>	<u>Base Stone Type 2*</u>	<u>Top Stone</u>
2"	100		
1-1/2"	90-100		
1"	75-100	100	
3/4"	65-95	90-100	
1/2"	55-85	80-100	100
3/8"	40-75	70-100	85-100
1/4"	25-65	60-90	75-100
#4	15-60	50-85	60-90
#8	0-40	30-65	35-75
#16	0-20	10-50	10-55
#30	0-10	0-35	0-40
#60	0-8	0-15	0-15
#100	0-6	0-8	0-8
#200	0-5	0-2	0-2

*NOTE: Either Type 1 or Type 2 Base Stone is acceptable, depending on availability.

RESTRICTIONS:

To ensure structural stability: $D_{60}/D_{10} > 5$ and $1 < \frac{D_{30}^2}{D_{60}D_{10}} < 3$

To ensure separation of both stones:

D_{85} of top sand > 2
 D_{15} of base stone

And $3 < D_{50}$ of base stone < 6
 D_{50} of top sand

To ensure proper drainage: Permeability of top stone > 10 in/hr (0.007 cm/sec)
Permeability of base stone > 50 in/hr. (0.035 cm/sec)
Porosity of both stones $> 25\%$
(When stone is saturated and compacted to 95% Proctor.)

Depending on the type of rock present in the crushed stone mix, other mechanical characteristics might be necessary for approval.

"Dx" is the size of the sieve (in mm) that lets pass x% of the stone. For example D60 is the size of the sieve that lets 60% of the stone pass. These sizes, for calculation purposes, may be obtained by interpolation on a semi-log graph of the sieve analysis.

- D. Soft limestone and shale materials are not suitable. Questionable materials should be evaluated using a sulfate soundness test (ASTM C-88 and LA Abrasion Test (ASTM C-131).

Test Method	Criteria
Sulfate Soundness (C-88)	Not to exceed 12% Loss
LA Abrasion (ASTM C-131)	Not to exceed 40

3.06 TESTING PROTOCOL

- A. The testing agent must be accredited by the American Association for Laboratory Accreditation (A2LA) and must have at least five years experience in similar projects and test protocols. The testing agent must be A2LA accredited to perform all of the following testing protocols:
1. ASTM C 136: Sieve Analysis of Fine and Coarse Aggregates
 2. ASTM D 854: Specific Gravity of Soils
 3. ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock
 4. ASTM D 4972: pH of Soils
 5. ASTM D 1632: Standard Test Method for Particle Size Analysis and Sports Field Root Zone Mixes.
 6. Water Release Characterization
 7. Infiltration Rate (Saturated Hydraulic Conductivity (KSAT))
- B. The crushed stone samples shall initially be submitted to the District's Representative and Sprinturf for testing and approval 45 calendar days prior to scheduled placement on the playing fields. Sprinturf must provide written approval to the District and Contractor that the Permeable Aggregate Base meets and /or exceeds their requirements for use under their sports turf product. Contractor shall not import any Permeable Aggregate Base to the site without prior written acceptance of the base material by Sprinturf.

The Contractor shall include the following items:

1. Identification of proposed source and supplier.
2. Current lab mechanical analysis of the proposed stone using standards for sieve analysis.
3. Sample sizes as determined by the District or District's Representative.
4. Certification that the supplier can deliver the total quantity of material needed to complete the project in a timely manner.

- C. All crushed stone must come from one supplier only. During construction, samples will be taken and analyzed periodically by the District or District's Representative to assure strict compliance with the specifications. The District shall have the option of sampling and testing either at the source or from incoming trucks at the project site. Material delivered to the site not meeting specifications shall be rejected by the District. All material rejected by the District shall be removed from the site at the Contractor's expense.
- D. The Contractor shall initially submit a one-gallon sample of each size of crushed stone. The District's testing agent will evaluate these materials for conformance to material specifications. The criteria for the accepted submittals will become the basis for the acceptance or rejection of materials during the quality control phase of the project.
- E. Quality Control Testing during construction shall be as follows:
 - 1. The surface of the processed stone course shall be well drained at all times. The permeability of the aggregate shall be checked per Din 8035 Part 7 (preferred), ASTM 2434 (constant head), or ASTM D3385 (double-ring) testing methods. Test samples shall be taken (at a minimum of) one sample per every 5,000 square feet or as otherwise directed by the District's Representative and Sprinturf.
 - 2. All test results will be logged and documented by the District's Engineer/Soils Technical Representative. If at any time the processed stone base does not meet specifications, it shall be the Contractor's responsibility to restore, at his expense, the processed stone base to the required grade, cross section and density.
 - 3. After the Contractor has independently confirmed compliance with all the above tolerances (planarity and elevation verified by a licensed surveyor and compaction, gradation, & permeability verified by Engineer/Soils Technical Representative), he shall notify the District and schedule a final inspection by the District and Sprinturf for approval. The Contractor shall make available an orbital laser system to the Inspection Team for the inspection process.
 - 4. The Contractor shall submit one-gallon composite sample of each size of crushed stone representing every 500 tons of material placed to the testing agent for comparison with the approved material. No materials should be relocated until the lab has approved the submitted samples.
 - 5. Based on initial submittals, the crushed stone materials approved by the District or District's Representative for the field construction shall supercede the baseline specification established in the design document. The Contractor shall be responsible for all failed testing and will be back charged by the District.
 - 6. 500 ton piles of crushed stone shall be tested by the District or District's Representative and released only after all piles are confirmed uniform and consistent to the approved sample submitted to the lab.

3.07 PLACING THE CRUSHED STONE

- A. Delivery Moisture Content: Processed stone must contain 90% to 100% of the optimum moisture content to ensure that fines do not migrate and to facilitate proper compaction. The Constructor shall ensure aggregate leaving the source plant meets this requirement and is required to apply water to the processed stone on site to attain and maintain this minimum moisture content.
- B. The crushed stone must be laid without damaging the subgrade. It is very important to not create any depressions with heavy equipment. The specified stone or aggregate supplied must conform to the specifications, and must be stable and permeable.
- C. Should any separation of the materials occur, during any stage of the spreading or stockpiling, the Contractor must immediately remove and dispose of segregated material and correct or change handling procedures to prevent any further separation.
- D. In performing this work, the Contractor shall avoid damage to any existing structures or features of the playing field or features under construction, such as drainage and irrigation systems. Any such damage shall be repaired by the Contractor at his own expense.
- E. As part of this work, the Contractor shall check all graded areas and assure that all features of the subgrade area at the proper finished grade, with no changes or damage to grades, as specified herein and on the grading plan.
- F. The Contractor shall utilize a laser plane control system for the grading of the processed stone to ensure accuracy in the grade tolerances of +0" to -1/4".
- G. Crushed stone trucked into the site must be done in such a manner as not to alter the subgrade and/or damage drainage and irrigation systems.
- H. The crushed stone shall be carefully and evenly spread. Excess water should not be applied when dumping and rough grading as it could create a soft sub-base that could alter constructed grades and damage the drainage system.
- I. Install processed stone base, from sideline toward centerline, parallel to the composite drain network, to the lines and grades shown on the drawings. Under no circumstance shall the material be pushed more than 30' from the point of discharge.
- J. The crushed stone shall then be carefully smoothed and uniformly compacted to the finished grade by alternately raking, watering, and rolling. All surfaces shall then be checked for irregularities due to settling and brought back to a uniform grade.

- K. The Contractor shall shape the complete surface of the processed stone to receive the elastic layer component and continue until the deviation from the required elevation does not exceed a maximum deviation from grade of -0" to -1/4" in ten (10) feet, when measured in any direction using a 10' straight-edge.
- L. Each layer must be spread uniformly with equipment that will not cause perceptible separation in gradation (segregation of the aggregates), preferably a self-propelled paving machine or small laser controlled low ground pressure (LPG) dozer.
- M. The Contractor shall contact Sprinturf prior to the placement of the Permeable Aggregate Base and schedule at a minimum two (2) site observation visits by the Sprinturf installer. Subsequent to the site observation visits, Sprinturf shall make any recommendations they deem necessary to the installation procedure in writing to the District, the Contractor and the Architect.

3.08 COMPACTION AND PLANARITY

- A. The processed stone shall be compacted to a minimum density of not less than 95% of maximum density as determined by ASTM D698 and measured using a nuclear method.
- B. Proof roll wherever possible and mark "soft spots" for additional compaction. Use static tandem drum-type roller of not less than five (5) tons weight.
- C. The finished surface shall not deviate (tolerance-to-grade) from designated compacted grade. This means that the surface shall not deviate more than 1/4" in 10' (any direction? When placed under a 10-foot straight edge. This tolerance is required over the entire field. Areas that deviate should be marked with spray paint and corrected with 3/8" limestone or granite chips and rolled tight to achieve proper density. Such remedial actions should be done by hand.

3.09 INSPECTION

- A. Inspect Base for Tolerance and Moisture

The General Contractor is responsible to inspect the base to ensure the base is smooth and finished properly to a tolerance of 1/8" in any 10' radius. The General Contractor is responsible to ensure the base is cured properly and that the moisture content is appropriate prior to installation.

- B. Inspect Base for Finish and Smoothness

Sprinturf or an authorized installer of Sprinturf is to inspect the base to ensure the base is smooth and finished properly. If the base is acceptable then the installation will proceed. If the base is not acceptable, Sprinturf or an authorized installer of Sprinturf will inform the General Contractor immediately, so that the base can be refinished.

C. Inspect for Compliance with General Conditions

Sprinturf or an authorized installer of Sprinturf is to inspect the facility to ensure compliance with the general conditions. If the general conditions are not complied with, Sprinturf or an authorized installer of Sprinturf will inform the General Contractor immediately, so that the situation can be rectified. The permeable base material must be certified and accepted by the turf manufacturer also.

D. Examine final grades and installation conditions. Do not start installation and equipment work until unsatisfactory conditions are corrected.

3.10 INSTALLATION

A. Pre-Installation Preparation: Sprinturf or an authorized installer of Sprinturf will unload the necessary materials to perform the installation of the Sports Surfacing System and place it along the perimeter of the area to be surfaced.

B. Trim and Edge: Sprinturf or an authorized installer of Sprinturf will inspect the trim and edge work to ensure its correctness. Any trim or edge work required by Sprinturf or its agent will be performed at this time.

C. Initial Layout of Field Material: Sprinturf will locate the perimeter of the area to be surfaced and determine its accuracy. If any discrepancies exist in the layout of the area to be surfaced, Sprinturf or an authorized installer of Sprinturf will inform the General Contractor immediately. The Sports Surfacing System will then be unwrapped and placed in accordance with the approved seam diagram.

D. Seaming of Material: Sprinturf or an authorized installer of Sprinturf will cut and seam the Sports Surfacing System to ensure a professional finish, utilizing approved methods and procedures.

E. Marking of Field

1. In-Laid: Sprinturf or an authorized installer of Sprinturf will apply any game line markings as indicated on the approved Sports Surfacing System layout drawing. Sprinturf or its agent will perform this work utilizing approved materials, methods and procedures.

2. Field markings and decorations shall be installed in accordance with approved project shop drawings.

F. Impregnated Layer – Rubber/Sand Mix: Sprinturf or an agent of Sprinturf will spread consistently and impregnate the mixture of granulated rubber and sand into the Sports Surfacing System. Sprinturf or its agent will ensure the granulated rubber and kiln dried sand layer is impregnated consistently over the entire Sports Surfacing System. Sprinturf or its agent will perform this work utilizing approved materials, methods and procedures.

- G. Trim and Edge Attachment: Sprinturf or an authorized installer of Sprinturf will complete the attachment or install the trim edge surrounding the Sports Surfacing System as specified in the approved Sports Surfacing System layout drawing.
- H. Break In Period: Sprinturf or an authorized installer of Sprinturf will explain the break in period to the District and General Contractor. The break in period is a time of increased maintenance and care to bring the surface to its optimum playing condition.
- I. The sub base shall be inspected by the Engineer or Sitework Contractor by means of a laser level and plotted on a 10-foot grid. Based upon the Contractor's inspection of the topological survey, the Sitework Contractor shall fine grade the sub base suitably – including properly rolling and compacting the base to achieve a surface planarity with 1/4" in 10 feet.
- J. The Turf Project Superintendent shall thoroughly inspect all materials delivered to the site both for quality and quantity to assure that the entire installation has sufficient materials to maintain the schedule and proper mixing ratios.
- K. Artificial turf shall be loose laid across the field, stretched, and attached to the perimeter edge detail. Turf shall be of sufficient length to permit full cross-field installation. No dead or cross seams will be allowed, except as required for inlaid fabric striping or to accommodate programmed cutouts.
- L. The full width rolls shall be laid out across the field. Utilizing standard state-of-the-art sewing procedures, each roll shall be attached to the next. When all of the rolls of the playing surface have been installed, the sideline areas shall be installed at right angles to the playing field turf. GLUING OF ROLLS SHALL NOT BE ACCEPTABLE.
- M. Infill materials shall be properly applied in numerous thin lifts using special broadcasting equipment to produce a layered system of recycled SBR rubber particles or 30% sand and 70% rubber. The turf shall be raked and brushed properly as the mixture is applied. The infill material shall be installed to a depth of about 1.50 inches. The infill materials can only be applied when the turf fabric is bone dry.
- N. This is a 99% sewn installation. Gluing of rolls shall not be acceptable. Minimum gluing will only be permitted to repair problem areas, corner completions, and to cut in any logos or inlaid lines as required by the specifications. All seams shall be sewn using double bagger stitches and polyester thread (per the manufacturer's standard procedures). Seams shall be flat, tight and permanent with no separation or fraying.
- O. The infill system shall be on the only cushioning system. E-layers and formed rubber pads shall be deemed unacceptable as enhancements to meet the necessary safety requirements.

- P. The turf constructor shall provide the necessary data to the District that the finished field meets or exceeds the required shock attenuation.
- Q. Thread for sewing seams of turf shall be as recommended by the artificial turf manufacturer.
- R. Seaming fabric for inlaying lines and markings shall be as recommended by the artificial turf manufacturer.
- S. Artificial turf shall be attached to the perimeter edge detail in accordance with the manufacturer's standard projects.

3.11 FINISHING

- A. Final Groom: Sprinturf or an authorized installer of Sprinturf will complete the final grooming of the surface. The final grooming shall consist of four passes by grooming equipment in each of the four directions. This process will ensure that the impregnated layer has been installed uniformly throughout the Sports Surfacing system. The final groom will ensure the surface is available and safe for play.
- B. Final Inspection of Surface: Sprinturf or an authorized installer of Sprinturf will conduct a final inspection of the Sports Surfacing System with the District, General Contractor or facility representative as directed. During this final inspection, the entire surface will be inspected by, Sprinturf will rectify or explain any concerns regarding the surface to the General Contractor. Upon acceptance of the surface the General Contractor will signify acceptance of the surface by signing the "Workmanship Satisfaction Acceptance Certificate and Warranty Request Form".
- C. Clean Up and Removal
 - 1. Upon execution of the "Workmanship Satisfaction Acceptance Certificate and Warranty Request Form", Sprinturf will remove excess and waste materials from the area of work.
 - 2. Turf contractor shall provide the labor, supplies and equipment as necessary for final cleaning of surfaces and installed items.
 - 3. All usable remnants of new materials shall become the property of the District.
 - 4. The turf contractor shall keep the area clean throughout the project and clear of debris.
 - 5. Surfaces, recesses, enclosures, etc., shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use the District.
 - 6. After completion of installation, and completion of other major work in areas, remove protective coverings, if any, and clean equipment internally and externally. Restore exposed and semi-exposed finishes to remove abrasions and other damages and touch-up painted surfaces. Replace work which cannot be successfully restored.

- D. Acceptance of Surface: The Acceptance of Surface occurs upon the execution of the "Workmanship Satisfaction Acceptance Certificate and Warranty Request Form". This acceptance includes the agreement of the District/General Contractor to follow the procedures for the break in period, acceptance of a working knowledge of the maintenance procedures, and the agreement to keep the Sports Surfacing System closed and secure throughout the curing period and until first use.
- E. Presentation of Warranty Certificate: Upon execution of the "Workmanship Satisfaction Acceptance Certificate and Warranty Request Form" Sprinturf will issue by priority post the official Warranty Certificate directly to the District.

4.0 OTHER MATERIALS AND EQUIPMENT

4.01 MAINTENANCE EQUIPMENT

- A. The artificial turf vendor shall furnish a tow behind sweeper units with hitch, excluding prime over vehicle. The sweeper attachments shall be of sufficient size to cover a 72" wide swath in a single pass. The sweeper attachment shall be fitted with artificial bristle brushes as recommended by the artificial turf manufacturer and shall be used primarily to collect surface debris.
- B. The sweeper unit shall be a Parker Suburbanite model 89580300.
- C. The turf contractor will train the District's facility maintenance staff in the use of the turf manufacturer's recommended sweeper/groomer equipment.

4.02 SPORTS FIELD EQUIPMENT

- A. Assemble and install equipment in strict accordance with manufacturer's recommendations.

4.03 SURPLUS MATERIALS

- A. Turf fabric – 500 square feet green plus 100 square feet of each additional field color.
- B. Infill Material: as required infill 250 square feet to the minimum depth.

4.04 SITE CLEAN UP

- A. The premises shall be kept free from accumulation of waste and rubbish by the turf contractor. At the completion of the work and as necessary during the progress of the work, remove from the premises all surplus materials, rubbish and debris created by the turf contractor.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL DESCRIPTION

- A. Textured acrylic surfacing for asphalt or concrete basketball courts, similar play areas, pedestrian plazas, and areas of light vehicular traffic.

1.2 RELATED SECTIONS

- A. Related Work
 - 1. Asphalt concrete pavement Section 32 12 16
- B. References
 - 1. National Asphalt Paving Association (NAPA)
 - 2. American Sport Builders Association (ASBA)

1.3 QUALITY ASSURANCE

- A. Surfacing shall conform to the guidelines of the ASBA for planarity.
- B. All surface coating products shall be supplied by a single manufacturer.
- C. The contractor shall record the batch number of each product used on the site and maintain it through the warranty period.
- D. The contractor shall provide the inspector, upon request, an estimate of the volume of each product to be used on the site.
- E. The installer shall be an authorized applicator of the specified system.
- F. The manufacturer's representative shall be available to help resolve material questions.

1.4 SUBMITTALS

- A. Manufacturer specifications for components, color chart and installation instructions.
- B. Authorized Applicator certificate from the surface system manufacturer.
- C. Reference list from the installer of at least 5 projects of similar scope done in each of the past 3 years.
- D. Current Material Safety Data Sheets (MSDS).
- E. Product substitution: If other than the product specified, the contractor shall submit at least 7 days prior to the bid date a complete type written list of proposed substitutions with sufficient data, drawings, samples and literature to demonstrate to the owners satisfaction that the proposed substitution is of equal quality and utility to that originally specified. Information must include a QUV test of at least 1000 hours illustrating the UV stability of the system. Under no circumstances will systems from multiple manufacturers be considered.

1.4 MATERIAL HANDLING AND STORAGE

- A. Store materials in accordance with manufacturer specifications and MSDS.
- B. Deliver product to the site in original unopened containers with proper labels attached.
- C. All surfacing materials shall be non flammable.

1.5 GUARANTEE

- A. Provide a guarantee against defects in the materials and workmanship for a period of one year from the date of substantial completion.

1.6 INSTALLER QUALIFICATIONS

- A. Installer shall be regularly engaged in construction and surfacing of acrylic tennis courts, play courts or similar surfaces.
- B. Installer shall be an Authorized Applicator of the specified surface system.
- C. Installer shall be a builder member of the ASBA.

1.7 MANUFACTURER QUALIFICATIONS

- A. System manufacturer shall be a US owned company.
- B. System manufacturer shall be a member of the ASBA.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. California Products Corp., Andover, MA. 01810 / Plexipave System www.plexipave.com
- B. Substitutions: Submit requests at least 7 days prior to the bid date with a complete type written list of proposed substitutions with sufficient data, drawings, samples and literature to demonstrate to the owners satisfaction that the proposed substitution is of equal quality and utility to the specified product. Information must include a QUV test of at least 1000 hours illustrating the UV stability of the system. The system shall have an ITF pace rating in Category 3. Under no circumstance may the final color surface contain silica sand added at the job site.

2.2 MATERIALS

- A. Patching Mix (California Court Patch Binder) - for use in patching cracks, holes, depressions and other surface imperfections.
- B. Crack Filler (Plexipave Crack Filler) - for use in filling fine cracks.
- C. Acrylic Color Playing Surface (Plexichrome/Acrylotex MA & LA Color Base) – for use as the finish color and texture. Plexichrome and Acrylotex Color Base are blended at the job site with Portland Cement to achieve the correct surface texture.
- D. Color: Pro Purple (Indian Wells).
- E. Line Paint (California Line Paint) – for use as the line marking on the court/play surface.
- F. Water – for use in dilution/mixing shall be clean and potable.

2.3 MATERIAL SPECIFICATIONS

- A. Court Patch Binder – 100% acrylic resin blended with Portland Cement and silica sand .
- 1) Percent solids by weight (minimum) 46%
 - 2) Weight: 8.7-8.9 lbs./gallon
- B. Plexipave Crack Filler – 100% acrylic resin heavily filled with silica sand.
- 1) Percent solids by weight (minimum) 85%
 - 2) Percent solids by weight (minimum) 15 lbs./gallon
- C. Plexichrome – 100% acrylic resin (no vinyl copolymerization constituent) with selected light fast pigments. Green shall contain not less than 8% chrome oxide.
- 1) Percent solids by weight (minimum) 36.5%
 - 2) Weight 10.0-10.2 lbs./gallon
- D. Acrylotex MA & LA Color Base – 100% acrylic resin containing no vinyl copolymerization constituent. Contains not more than 63% specifically graded silica sand.
- 1) Percent solids by weight (minimum) 74%
 - 2) Weight 13.1-14.1 lbs./gallon
- E. California Line Paint – 100% acrylic resin containing no alkyds or vinyl constituents. Texturing shall be rounded silica sand.
- 1) Percent solids by weight (minimum) 60.5%
 - 2) Weight 12-12.3 lbs./gallon

All surfacing materials shall be non-flammable and have a VOC content of not less than 100g./ltr. Measured by EPA method 24.

Local sands are not acceptable in the color playing surface. Sands must be incorporated at the manufacturing location to insure quality and stability.

PART 3 - EXECUTION

3.1 WEATHER LIMITATIONS

- A. Do not install when rainfall is imminent or extremely high humidity prevents drying.
- B. Do not apply unless surface and air temperature are 50°F and rising.
- C. Do not apply if surface temperature is in excess of 140°F.

3.2 PREPARATION FOR ACRYLIC COLOR PLAYING SYSTEM

Asphalt surfaces must be fully cured at a minimum of 14 days in summertime conditions.

Concrete surfaces must have a minimum 28 day cure time. Concrete should have a Class B vapor barrier directly beneath slab. Concrete surface shall have a medium broom finish. The concrete shall have a water cement ration of 0.45 or less and no curing agents or sealers may be used.

- A. Clean surfaces of loose dirt, oil, grease, leaves, and other debris in strict accordance with manufacturer's directions. Pressure washing will be necessary to adequately clean areas to be coated. Any areas previously showing algae growth shall be treated with Clorox or approved product to kill the organisms and then be properly rinsed.
- B. Holes and cracks: Cracks and holes shall be cleaned and a suitable soil sterilant, as approved by the owner, shall be applied to kill all vegetation 14 days prior to use of **Court Patch Binder** according to manufacturer's specifications.
- C. Depression: Depressions holding enough water to cover a five cent piece shall be filled with Court Patch Binder Patching Mix. 3 gallons of Court Patch Binder, 100 lbs. 60-80 silica sand, 1 gallon Dry Portland Cement (Type I). The contractor shall flood all the courts and then allow draining. Define and mark all areas holding enough water to cover a nickel. After defined areas are dry, prime with tack coat mixture of 2 parts water/1 part Court Patch Binder. Allow tack coat to dry completely. Spread Court Patch Binder mix true to grade using a straight edge (never a squeegee) for strike off. Steel trowel or wood float the patch so that the texture matches the surrounding area. Never add water to mix. Light misting on surface and edges to feather in is allowed as needed to maintain workability. Allow to dry thoroughly and cure.

NO WORK FROM THIS STAGE ON SHALL COMMENCE UNTIL AN INSPECTOR HAS ACCEPTED THE SURFACE.

IF A SMOOTHER TEXTURE (ASPHALT ONLY) IS DESIRED PROCEED WITH FILLER COURSE, OTHERWISE CONTINUE TO COLOR APPLICATION SECTION 3.3

3.3 APPLICATION OF ACRYLIC COLOR PLAYING SURFACE

- A. All areas to be color coated shall be clean, free from sand, clay, grease, dust, salt or other foreign matters. The Contractor shall obtain the Engineer's approval, prior to applying any finish surface material.
- B. Blend color base and Plexichrome with a mechanical mixer to achieve a uniform Acrylotex mixture. The mix shall be:

Acrylotex Color Base	30 gallons
Plexichrome	20 gallons
Water	20 gallons
White Portland Cement (dry)	1-2 gallons

Note: 1gallon equals approximately 22 lbs. dry Portland cement

- C. Application shall be made by 50 durometer rubber faced squeegees. The Acrylotex mixture should be poured on to the court surface and spread to a uniform thickness in a regular pattern.
- D. A total of 2 applications of Acrylotex MA and 1 application of Acrylotex LA shall be made to achieve a total application rate of not less than .16 gal./sy. of Acrylotex MA and total application rate of not less than .7 gal/sy. of Acrylotex LA. No application should be made until the previous application is thoroughly dry.

3.4 LINE PAINTING

- A. All lines shall be 2" wide unless otherwise noted on the drawings. Lines shall be carefully laid out in accordance with ASBA and USTA guidelines. The area to be marked shall be taped to insure a crisp line. The California Line Paint shall have a texture similar to the surrounding play surface. Application shall be made by brush or roller at the rate of 150-200 sf./gal. (3/4 gal. per tennis court).

3.5 APPLICATION FOR LESS TEXTURED SURFACE

- A. Multi Sport play areas, especially tennis or basketball courts, may receive an extra coat of Plexichrome and water mixture which will create a smoother surface than Acrylotex alone. This will also extend the durability of the playing surface.

3.6 PROTECTION

- A. Erect temporary barriers to protect coatings during drying and curing.
- B. Lock gates to prevent use until acceptance by the owner's representative.

3.8 CLEAN UP

- A. Remove all containers, surplus materials and debris. Dispose of materials in accordance with local, state and Federal regulations.
- B. Leave site in a clean and orderly condition.

END OF SECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 1 specification sections, apply to this Section.
- B. Related Sections - the following Sections contain requirements that relate to this Section:
 - 1. Section 02 30 00 - Subsurface Exploration.
 - 2. Section 02 41 19.13 - Selective Demolition
 - 3. Section 31 00 00 - Earthwork.
 - 4. Section 31 22 13 - Rough Grading.
 - 5. Section 31 23 13 - Excavating, Backfilling, and Trenching.
 - 6. Section 32 80 00 - Irrigation system.
 - 7. Section 33 10 00 - Water Distribution.
 - 8. Section 32 12 16 - Asphaltic Concrete Paving.
 - 9. Section 32 13 13 - Portland Cement Concrete Paving.
 - 10. Section 03 30 00 - Cast-In-Place Concrete.
 - 11. Section 21 13 00 - Wet Pipe Sprinkler System.
 - 12. Section 22 10 00 - Plumbing Piping.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Furnish and install sanitary sewer service, connection to existing sewer main, and clean-outs.
 - 2. Furnish and install domestic water service and connection.
 - 3. Furnish and install fire protection water service and connection.
 - 4. Furnish and install natural gas service and connection.
 - 5. Testing of sanitary sewer and domestic water.
 - 6. Sterilization of water line.

1.03 REFERENCE STANDARDS

- A. Local Regulatory Agency (City/County) Design Standards and Standard Drawings.
- B. Standard Specifications for Public Works Construction, latest Edition.
- C. California Plumbing Code (CPC).
- D. American Water Works Association (AWWA).

- E. American Society for Testing and Materials (ASTM).
- F. American National Standards Institute (ANSI).
- G. Standards from all other agencies having jurisdiction over work.
- H. National Fire Protection Agency 13 (2002).
- I. National Fire Protection Agency 24 (2002).

1.04 SUBMITTALS

- A. Section 01 33 00 - Submittals.
- B. Submit to Architect manufacturer's drawings and related catalog data for the following:
 - 1. Piping
 - 2. Clean-outs
 - 3. Valves
- C. Submit to Architect a detailed Trench Safety Plan in accordance with the requirements of Section 31 00 00 - Earthwork.

1.05 QUALITY ASSURANCE

- A. Notwithstanding, any reference in the Specifications to any article, device, product, material, form or type of construction by name, make or catalog number, such references shall be interpreted as establishing a standard of quality and alternate items may be submitted for review unless listed item is noted "No Substitution or Alternates Will Be Permitted."
- B. Comply with the latest requirements of the following agencies, insofar as they have jurisdiction over the work:
 - 1. The Local Regulatory Agency (City/County).
 - 2. Local Gas & Electric Company.
 - 3. CAL-OSHA (The Federal Occupational Safety and Health Act of 1970).
 - 4. Business and Professions Code of the State of California.
 - 5. All other agencies having jurisdiction over the work.

1.06 PROJECT/SITE CONDITIONS

- A. Barricade open excavations, made as part of the work described herein, and mark with warning lights operating from dusk to daylight.

- B. Site Examination: No allowance will be made for any costs incurred by the Contractor, subsequent to Contract award, due to his failure to have notified the Architect, prior to submitting his proposal, of all discrepancies encountered between the Drawings, Specifications, and actual site conditions which are discernible.

- C. Existing Utilities:
 - 1. Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
 - 2. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the Architect immediately for directions as to procedure. Cooperate with Architect and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of the utility owner.
 - 3. Do not interrupt existing utilities serving facilities occupied and used by others, except when permitted in writing by the Architect and then only after acceptable temporary utility services have been provided.
 - 4. Protect in place all existing improvements, structures and underground utilities to remain.
 - 5. The location of existing underground facilities shown on the drawings were obtained from a search of available record drawings. The contractor shall take precautionary measures to protect any existing facility shown on the drawings, and any other which is not shown on the drawings. The contractor shall pothole existing utilities at points of connection and all utility crossings to determine exact location prior to starting work.
 - 6. Arrange for, and coordinate shut down, disconnection and capping of existing utilities with appropriate utility owners prior to commencing the work.
 - 7. Contractor shall coordinate with the utility company prior to start of construction for final and exact work/material requirements and construct to utility company engineering plans and specifications only. Contractor shall furnish and install all conduits, pull wires, cables, pullboxes, concrete encasement of conduits, transformer pads, barriers, pole risers, trenching and backfill, and pay all utility company fees and include all requirements in scope of work.

8. Locations of utilities shown are approximate and contractor shall exercise extreme caution in excavating and trenching on this site to avoid hazard to personnel and/or damage to existing underground utilities or structures, whether or not shown and installed by any other contracts. The engineer is not responsible for the location of underground utilities or structures whether or not shown or detailed and installed by any other contracts. The contractor shall immediately notify the engineer should such unidentified conditions be discovered. These drawings and specifications do not include the necessary elements for construction safety.

1.07 PROTECTION OF MATERIALS AND PROPERTY

Protect benchmarks, sidewalks, paving and curbs against damage.

1.08 SITE EXAMINATION

No allowance will be made for any costs incurred by the Contractor, subsequent to Contract award, due to his failure to have notified the Architect, prior to submitting his proposal, of all discrepancies encountered between the Drawings, Specifications, and actual site conditions which are discernible.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Piping:
 1. All fittings, flanges, and unions shall be standard manufactured products.
 2. Sanitary Sewer (per Section 33 31 00).
 3. Domestic Water (per Section 33 10 00).
 4. Fire Protection Water (per Section 33 10 00).
- B. Clean-outs: Cast iron clean-out at all areas, complete with serrated shut-off ferrule, brass plug with neoprene seal, adjustable head and heavy duty scoriated cover secured with screws.
- C. Valves: Refer to Section 33 10 00.
- D. Fire Department Connection: 2-way exposed siamese type, 2-1/2" double connector, national standard threads, Sierra S-207, Badger-Powhatan No. 21-207, or equal. Verify with local regulatory agency.
- E. Bedding Material: See Section 31 00 00 - Earthwork.

- F. Portland Cement Concrete: Class "B", Section 90 of CSS, Type II Portland Cement per ASTM C-150.

PART 3 - EXECUTION

3.01 TRENCHING, EXCAVATION AND BACKFILL

Refer to Section 31 00 00 - Earthwork for utility trenches.

3.02 PLACING PIPE

- A. Sewer pipe shall be laid in strict conformity to the prescribed line and grade. The maximum deviation from grade shall not be in excess of 1/4".
- B. Pipe laying shall proceed upgrade with the bell ends placed upstream. Each section of pipe shall be laid in such a manner as to form a watertight, concentric joint with the adjoining pipe.
- C. Do not allow water to accumulate in trenches or open pipes.
- D. Provide concrete thrust blocks and encasement where detailed or specified.

3.03 STERILIZATION

Purge entire new portion of domestic water system and sterilize with 4 percent chlorine solution injected into system to a concentration of fifty parts per milliliter allowed to stand for 24 hours. Certify to the Architect that sterilization has been performed.

3.04 TESTING

- A. Perform tests of the sanitary sewer system in accordance with the testing procedures of the Local Regulatory Agency (City/County).
- B. Pressure test pressure domestic water pipe at 150 psig as required by AWWA. Test operate all valves at least once from closed to open to closed position while valve is under test pressure.
- C. Upon completion of testing, certify to the Architect in writing, that the specified tests have been performed and that the installation complies with the specified requirements.

3.05 CLEAN-UP

Keep work areas in workmanlike and safe condition so rubbish, wastes, and debris do not interfere with the work of others. Upon completion of work in this section, remove all rubbish, waste and debris resulting from the operation. Remove all equipment and implements of service and leave entire area in a neat, clean, acceptable condition to the satisfaction of the Architect.

END OF SECTION

SECTION 33 40 00

STORM DRAINAGE

PART1 GENERAL

1.01 SECTION INCLUDES

- A. Site storm sewer drainage piping, fittings, accessories, and bedding.
- B. Connection of building storm water drainage system to municipal storm sewers.
- C. Catch basins, paved area drainage, site surface drainage, and stormwater detention facilities.

1.02 RELATED REQUIREMENTS

- A. Section 31 00 00 - Groundwork
- B. Section 31 25 00- Erosion and Sedimentation Control
- C. Section 33 39 13 – Sewer Manholes, Frames, and Covers
- D. Section 03 30 00- Cast-In-Place Concrete: (See Architectural/ Building Specifications)
- E. Kristar Enterprises, Inc. FloGard Perk Filter Concrete Catch Basin (Single Cartridge) –
Manufacturer's Specifications and Details
- F. Kristar Enterprises Inc. CUDO Stormwater Systems - Manufacturer Specifications and
Details
- G. NDS Atrium Grate – Manufacturer Specifications and Details
- H. Construction Drawings

1.03 REFERENCE STANDARDS

- A. American Association of State Highway and Transportation Officials (AASHTO) latest edition
 - 1. M36 Zinc Coated (Galvanized) Corrugated Iron or Steel Culverts and Under Drains
 - 2. M170 Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.
 - 3. M190 Bituminous Coated Corrugated Metal Culvert Pipe and Arches
 - 4. M198 Joints for Circular Sewer and Culvert Pipe Using Flexible Watertight Gaskets
 - 5. M252 Corrugated Polyethylene Drainage Tubing, 3 to 10 Inch Diameter
 - 6. M294 Corrugated Polyethylene Drainage Tubing, 12 to 48 Inch Diameter
 - 7. MP7-97 Corrugated Polyethylene Drainage Tubing, 54 to 60 Inch Diameter
- B. American Society for Testing and Materials (ASTM) latest edition
 - 1. A74 Cast Iron Soil Pipe and Fittings

2. A185 Steel welded Wire Fabric, Plain, for Concrete Reinforcement
3. A615 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
4. A746 Ductile Iron Gravity Sewer Pipe
5. C76 Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
6. C150 Portland Cement
7. C206 Finished Hydrated Lime
8. C443 Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
9. C478 Precast Reinforced Concrete Manhole Sections
10. C564 Rubber Gasket for Cast Iron Soil Pipe and Fittings
11. C924 Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method
12. C949 Poly (Vinyl Chloride)(PVC) Corrugated Sewer Pipe with Smooth Interior and Fittings
13. C969 Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines
14. C990 Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
15. D3034 Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings
16. D 3212 Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
17. D3350 Polyethylene Plastic Pipe and Fitting Materials
18. F477 Elastomeric Seals (Gaskets) for Joining Plastic Pipe
19. F949 Poly (Vinyl Chloride)(PVC) Corrugated Sewer Pipe with Smooth Interior and Fittings
20. F1417 Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
21. F2306 12 to 60 Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications

C. American Concrete Institute (ACI)

1. ACI 301 Structural Concrete for Buildings

1.04 SUBMITTALS

- A. Product Data: Provide data on pipe materials, pipe fittings, and accessories. Provide shop drawings for precast inlets, catch basins and junction boxes.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified local requirements.

1.05 PROJECT RECORD DOCUMENTS

- A. Accurately record actual locations of pipe runs, connections, catch basins, cleanouts, and invert elevations.
- B. Identify and describe unexpected variations to subsoil conditions and location of uncharted utilities.

1.06 PROJECT CONDITIONS

- A. Coordinate work with termination of storm sewer connection outside building including connection to municipal storm sewer system.

PART2 PRODUCTS

2.01 STORM SEWER PIPE MATERIALS AND FITTINGS

- A. Reinforced Concrete Pipe (RCP): ASTM C 76, Class III, wall B (Class V under Railroads) except as noted on Construction Drawings, installed with flexible plastic, bitumen gaskets at joints.
 - 1. Gaskets: Joint material for RCP shall be rubber gasket conforming to the requirements of ASTM C443 or "tongue and groove" type filled with cement mortar.
 - 2. Flared end sections shall be class 1
- B. High Density Polyethylene Pipe (HOPE) Smooth Interior/Annular Exterior: AASHTO Designation M252 Type S, M294 Type S and MP7-97 Type S. Only permitted when specifically indicated on Construction Drawings. Pipe shall be installed in accordance with pipe manufacturer's installation Guidelines for Culvert Storm Drainage Applications.
 - 1. Pipe Joints and fittings shall conform to AASHTO M252 and M294.
 - 2. Acceptable manufacturers: Advanced Drainage Systems, Inc. "ADS N-12", HANCOR, INC. "Hi-Q", or approved equal.
- C. Polyvinyl Chloride (PVC) Pipe: ASTM D 3034, rated SDR 35, continually marked with manufacturer's name, pipe size, cell classification, SDR rating, and ASTM D 3034 classification. Only permitted when specifically indicated on Construction Drawings.
 - 1. Pipe joints: Joints for PVC shall conform to ASTM D 3212 using restrained gasket conforming to ASTM F477.
- D. Subdrains: Shall be perforated, PVC or Flexible corrugated plastic pipe as specified herein of the size indicated on the construction drawings.

2.02 INLETS, CATCH BASINS AND JUNCTION BOXES

- A. Lid and frame per details shown on Construction Drawings.
 - 1. Pedestrian-safe grates are required in high-traffic areas. Acceptable products include: Neenah R-1881 Series Narrow-Slotted Grates; East Jordan Iron Works V-57XX-80 Series grates; Bass & Hays Foundry VFG Pedestrian Rated Series.
- B. Structure construction in accordance with details shown on Construction Drawings and in accordance with Section 33 39 13.
- C. Cast-In-Place concrete for drainage structures including: manholes, inlets, catch basins, collars, support blocks, headwalls and paved ditches shall conform to ACI 301 and applicable reference specification therein and the following:
 - 1. Compressive Strength – 3500 psi at 28 days.
 - 2. Reinforcement – ASTM A615, grade 40 or 60 deformed reinforcing bars. Or A185 for wire fabric
- D. KriStar FloGard Perk Filter Concrete Catch Basin (Single Cartridge) to be installed per manufacturer's specification.

- E. Kristar CUDO Stormwater System to be installed per Manufacturer's Specification.
- F. NOS Atrium Grate to be installed per Manufacturer's Specification.
- G. Cement Mortar used for paving inverts, filling lift holes, joints, patching and anchoring castings shall consist of one part portland cement, type I, ASTM C150, 1/4 part hydrated lime, ASTM C206 and 2-1/2 parts clean, well-graded sand and water free of suspended matter, alkali, and containing no industrial or domestic waste.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that trench cut and excavation is ready to receive work and excavations, dimensions, and elevations are as indicated on Construction Drawings.

3.02 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation with bedding material.
- B. Remove large stones or other hard matter that could damage piping or impede consistent backfilling or compaction.
- C. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by licensed land surveyor and replaced, as necessary, by same.

3.03 BEDDING

- A. Excavate pipe trench and place bedding material in accordance with Section 31 23 00.

3.04 INSTALLATION- PIPE

- A. The pipe shall be inspected for defects and cracks before being carefully lowered into the trench, piece by piece. Any defective, damaged or unsound pipe or any pipe that has had its grade disturbed after laying shall be taken up and replaced. Open ends shall be protected with a stopper to prevent earth or other material from entering the pipe during construction. The interior of the pipe shall be free from dirt, excess water and other foreign materials as the pipe laying progresses, and left clean at the completion of the installation.
- B. Installation shall commence at the lowest point for each segment of the route. RCP shall be laid with the groove or bell end upstream. Riveted CSP shall be placed with the inside circumferential laps pointing downstream. Applying bituminous material conforming to AASHTO M190 shall repair damaged bituminous coating on CSP.
- C. Lay pipe to the required line and slope gradients with the necessary fittings, bends, manhole, risers and other appurtenances placed at the required location as noted on Construction Drawings.
- D. Do not displace or damage pipe when compacting.
- E. No pipe shall be laid in water or when trench conditions are unsuitable for such work.
- F. Joints:

1. Joints shall be constructed as described herein and in accordance with manufacturers installation instructions with the intent that they be made watertight.
2. For RCP, the joint surface shall be cleaned and washed with water, if necessary, before the joints are made. For tongue and groove joints in smaller sizes, butting the inside of the bell with a cement mortar before joining shall make the joints. The inside joint can be wiped clean of excess mortar by brush or a squeegee drawn through the pipe as the laying operations progress. In the larger diameters, which permit the entry of a man, an annular space is provided between pipe sections which shall be completely filled with mortar and finished off smooth with the inside surface of the pipe.
3. CSP shall be joined by standard corrugated connecting bands. Care shall be used to keep dirt or gravel out from between the pipes and band so that corrugations fit snugly. While being tightened, the bands shall be tapped with a mallet to take up slack and insure a tight joint.
4. PVC fittings shall be attached to the pipe by solvent welding according to the manufacturers recommendations.

3.05 INSTALLATION- CATCH BASINS, INLETS, AND JUNCTION BOXES

- A. Precast Sections:
 1. Precast section with bases shall be installed in accordance with Section 31 00 00 and 33 39 13 or as shown on construction drawings.
 2. Pipe openings shall be aligned to that of the pipe entering and leaving the manhole, etc. Pipe shall be properly aligned with connections to manholes, etc. as shown on the construction drawings.
- B. Cast-In-Place sections shall be as shown on the drawings and in accordance with Section 03 30 00.
 1. Form bottom of excavation clean and smooth to correct elevation.
 2. Form and place cast-in-place concrete base pad, with provision for storm sewer pipe to be placed at proper elevation.
 3. Form and place cast-in-place concrete walls, sleeved at proper elevation to receive storm sewer pipe in accordance with details shown on Construction Drawings.
- C. Invert channels shall be smooth and accurately shaped to a semicircular bottom conforming to the inside of the adjacent sewer section. Invert channels and structure bottoms shall be shaped with cement mortar. Changes in size and grade of invert shall be made gradually and evenly. Changes in direction of the sewer entering branch or branches shall have a true curve of as large a radius as the manhole will permit.
- D. Frames and Covers:
 1. Frames and covers shall be set to the proper elevation. The frames shall be firmly embedded in mortar approximately 1 inch thick and aligned to fit the top section of the structure.
 2. Bricks set in mortar used to adjust the frame to finished grade shall be limited to no more than four courses.
 3. Adjustment rings used to make adjustments in grade shall be made with the initial ring embedded in mortar and the exterior of the rings parged with mortar not less than 1/2 inch thick. No adjustment made in this manner shall exceed 8 inches.
- E. Concrete cradles shall be constructed as shown on the construction drawings and as needed when crossing over and under sewer pipe or utility lines. Concrete is to be 3000 psi mix with a minimum thickness of 6 inches.

- F. KriStar FloGard Perk Filter Concrete Catch Basin (Single Cartridge) to be installed per manufacturer's specification.
- G. KriStar CUDO Stormwater System to be installed per manufacturer's specification.
- H. NOS Atrium Grate to be installed per manufacturer's specification.

3.06 SUBDRAINS

- A. Subdrains shall be installed in accordance with the details and at the locations shown on the construction drawings

3.07 INSPECTION AND TESTING

A. General

- 1. Storm sewer systems and culverts, upon completion or at such time as directed, shall be cleaned, inspected and tested. The system or culvert shall have a true grade and line. Actual elevations shall be within 0.08 feet of the elevations given on the construction drawings.
- 2. After completion of the Work, or any part thereof, the job shall be tested to determine that it has been installed in accordance with the construction drawings and specifications. In general, the Work shall prove to be in good condition, installed in accordance with the construction drawings and specifications and ready for use.

B. Cleaning and Testing

- 1. The contractor is to visibly inspect and remove all debris and obstructions from storm pipe. All storm pipe is to be tested for infiltration and exfiltration by hydrostatic testing per ASTM C969. All manholes and pipe shall meet ASTM C969 leakage criteria.

C. Alignment Test

- 1. After backfill has been placed and compacted to a depth not less than one foot above top of pipe, a visual inspection shall be made by flashing a light between manholes. Any displacement or misalignment of invert shall be corrected.

END OF SECTION 33 40 00