PROJECT MANUAL FOR:

CAMPUS INFRASTRUCTURE UPGRADES

BAKERSFIELD, CALIFORNIA

01/29/26

MT. VERNON ELEMENTARY SCHOOL
BAKERSFIELD CITY SCHOOL DISTRICT
ARCHITECT PROJECT NO: 566-0020
DISTRICT PROJECT NO: 22251.00-34-MD

SET NO: _____

3434 Truxtun Ave. Suite #240 Bakersfield, CA 93301
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CAMPUS INFRASTRUCTURE UPGRADES
MT. VERNON ELEMENTARY SCHOOL
BAKERSFIELD CITY SCHOOL DISTRICT
BAKERSFIELD, CALIFORNIA
KERN OF COUNTY

APPROVED:
BAKERSFIELD CITY SCHOOL DISTRICT

BY: BOARD RESOLUTION

J. PATRICK FOGARTY, AIA
AP Architects
3434 Truxtun Ave., Suite 240
Bakersfield, CA 93301
C – 19670

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 03-125931 INC:
REVIEWED FOR
SS ☐ FLS ☑ ACS ☑
DATE: 06/23/2026

SECTION 011000 - SUMMARY OF WORK

11/01/16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes, but not limited to the following:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Work by Owner.
5. Work under separate contracts.
6. Future work.
7. Purchase contracts.
8. Owner-furnished products.
9. Contractor-furnished, Owner-installed products.
10. Access to site.
11. Coordination with occupants.
12. Work restrictions.
13. Specification and drawing conventions.
14. Miscellaneous provisions.

B. Related Requirements:

1. Division 1 Section 012100 “Allowances”: for purchase contracts.
2. Division 1 Section 015000 "Temporary Facilities" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification:

Campus Infrastructure Upgrades
Mt. Vernon Elementary School
2161 Potomac Ave,
Bakersfield, CA 93307

B. Owner:

Bakersfield City School District
Daniel Wastaferro
1300 Baker St,
Bakersfield, CA 93305

C. Architect:

AP Architects

J. Patrick Fogarty
3434 Truxtun Avenue Suite 240,
Bakersfield CA 93301

D. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work consists of campus wide infrastructure and site improvement replacement and site improvements as required.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 WORK UNDER OTHER CONTRACTS

A. Owner furnished products:

1. Items indicated on documents.

1.6 WORK SEQUENCE

A. The Work will be conducted in one phase to provide the least possible interference to the activities of the Owner's personnel and to permit an orderly transfer of personnel and equipment to the new facilities. Project completion is scheduled for specific number calendar days, (refer to Bid Proposal). Contractor shall review scope of work, and provide manpower, resources, etc., as required to complete project on or before the date required for project completion. Contractor shall allow in Proposal weekend workers, shifts of workers and additional productivity not limited to workers, materials, temporary facilities and equipment as required to meet project schedule with limited access times as indicated herein.

1.7 CONTRACTOR USE OF PREMISES

A. General: Limit use of the premises to construction activities in areas indicated; allow for Owner occupancy and use by the public.

1. Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
2. Keep driveways and entrances serving the premises clear and available to the Owner and the Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
3. When performing new construction on existing sites, become informed and take into specific account the maturity of the students on the site, and perform work which may interfere with educational facility routine before or after facility hours; enclose the work area with a substantial barricade and arrange work to cause a minimum of inconvenience and danger to students and staff in their regular facility activities.

B. Use of the Existing Building: Maintain the existing buildings in a weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the

construction period.

1.8 OWNER OCCUPANCY

A. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with the Owner's operations.

B. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building, prior to Notice of Completion provided that such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy the Owner will provide operation and maintenance of mechanical and electrical systems in occupied portions of the building.

C. All work shall be complete and approved prior to occupancy not limited to the following:

1. No portion of building may be occupied requiring impaired Required Fire Detection System unless system is installed and approved.
2. All completed work shall be in compliance with CBC 901.5 and CFC 901.5.1 related to acceptance tests.

1.9 WORK RESTRICTIONS:

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
2. Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor air intakes.
3. Use of controlled substances on the Project site is not permitted.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of **<Insert time>** a.m. to **<Insert time>** p.m., Monday through Friday, except as otherwise indicated.

1. Weekend Hours: **<Insert restrictions on times permitted for weekend work>.**
2. Early Morning Hours: **<Insert restrictions or references to regulations by authorities having jurisdiction for restrictions on noisy work>.**
3. Hours for Utility Shutdowns: Arranged and agreed to advance shutdown with Owner.
4. Hours for **[Core Drilling] <Insert noisy activity>: <Insert Owner's restrictions>**.

C. Construction work that generates noise beyond 90db that will disturb adjacent areas shall be scheduled around class schedule and office hours of occupied rooms within 125 feet of work to be done. This work may have to be done during after hours, evenings and Contractor shall verify class schedules when work will generate noise beyond 90db.

D. Deliver materials to the building area over the route designated by the facility Maintenance and Operations department. Times of deliveries shall coincide not to be done during 5 minutes before class change time between classes and 5 minutes after if said deliveries

path is thru any area students will occupy during class change times. If a delivery is overlapping class change times, cease work, provide temporary barricades and resume 5 minutes after classes resume.

PART 2 - PRODUCTS (Not applicable).

PART 3 - EXECUTION (Not applicable).

END OF SECTION 011000

SECTION 012100 - ALLOWANCES 04/16/15

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 &1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements governing handling and processing allowances.

1. Selected materials, services, equipment, related items and in some cases, their installation and related/non-related work are shown and specified in the Contract Documents by allowances herein. Allowances have been established in lieu of additional requirements and to defer selection of actual materials, miscellaneous additional work scope and equipment to a later date when additional information is available for evaluation.
2. Special allowances have been established for unforeseen conditions, latent conditions and related item to be authorized by the Architect for use.

B. Types of allowances required include the following:

1. Lump sum allowances in Base Bid.
2. Lump sum allowances in Alternate Bid.

C. Related Requirements:

1. Division 1 Section "Modification Procedures" for procedures for submitting and handling Change Orders.
2. Division 1 Section “Summary of Work” for additional requirements on purchase contracts.

1.3 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

B. Submit invoices or delivery slips to indicate actual quantities of materials delivered to the site for use in fulfillment of each allowance.

1.4 ALLOWANCES

A. Use the allowance only as directed for the Owner's purposes, and only by Supplementary Instructions, which designate amounts to be charged to the allowance.

1. The direct costs for products or equipment ordered by the Owner under the lump sum allowances, including delivery, installation, taxes, and similar costs are part of the allowance. Vendor shall provide insurance as required by the Owner. Contractor shall agree to accept insurance required by Owner for vendor for allowance item. If the contractor requires any special insurance, additional requirements and or bonding of any allowance vendor, contractor shall allow for this cost in his base bid or alternate bid if allowance is tied to an alternate.

a. In the event the work under allowance cannot be completed during the duration of the project as prescribed under “Project Summary”, contractor may elect to request additional extended overhead. Extended overhead will be determined by actual costs incurred by contractor specific to this project and verified by project schedule.

2. Supplementary Instructions (SI) authorizing use of funds from the lump sum allowance will not include the Contractor's related costs and reasonable overhead, supervision, profit margins and other related costs as these costs are already in the contractor’s proposal/bid.
3. If any individual allowance contains surplus funds or contains deficient funds, Architect may transfer funds between allowances as necessary.
4. At Project closeout, credit unused amounts remaining in the allowance to Owner by Negative Change Order amount for unused amounts.
5. The contractor shall include in his base bid all overhead, profit, supervision, bonds, insurance and all other indirect costs for allowance items. None of these items will be added to lump sum and miscellaneous allowance as it is used by the Owner and directed by the architect. In the event the allowance is required in an Alternate, the contractor shall include in his alternate bid all overhead, profit, supervision, bonds, insurance and all other indirect costs for allowance items specific to that alternate.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 INSPECTION

A. Inspect products covered by an allowance promptly upon delivery for damage or defects.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related construction activities.

B. Coordinate scheduling of Owner selected Vendors. Obtain availability schedules from Vendors early in project to coordinate timing of special milestones and products necessary for implementation into overall construction activities.

3.3 SCHEDULE OF BASE BID ALLOWANCES

A. Allowance No. 1: Include a lump sum allowance of $200,000.00 for use upon the Architect’s instructions.

END OF SECTION 012100

SECTION 012600 - MODIFICATION PROCEDURES 11/01/16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification sections, apply to this section.

1.2 SUMMARY

A. This section specifies administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK and REQUEST FOR INFORMATION (RFI)

A. Supplemental instructions authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time, will be issued by the Architect. The Architect may issue written Supplemental Instructions, (SI), which interpret the Contract Documents or which order minor changes in the work without change in Contract sum or Contract time. The Contractor shall carry out such Supplemental Instructions promptly.

1. Unless otherwise noted, SI, (Supplemental Instructions) does not warrant a cost or time impact to the Contract cost or time. If Contractor does not agree, Contractor has 10 calendar days from date of receipt of SI to file a claim for adjustment in writing to the architect.
2. The Architect shall use SI's for written order for usage of allowance funds for project if any allowances are indicated.

B. Contractor shall be able to ask valid questions concerning items required to construct project. This shall be done by the following methods in order as follows: (1) Contractor to review plans and determine if information is prescribed therein; (2) Contractor to review question with Project Inspector and determine if information is indicated, intended and/or prescribed in construction documents; (3) Contractor place an informal inquiry with architect and discuss question: and if no answer is determined then (4) Contractor shall prepare a Request for Information (RFI) and deliver to architect for determination of answer and or direction from architect as prescribed herein.

1. Contractor shall submit Request for Information (RFI) on enclosed form at end of this Section.
2. Contractor shall attach to RFI what they consider to be answer to Request for Information. Failure to provide this information shall be grounds for Architect to Request for Clarification.
3. An RFI is defined as a request for information for information that cannot be found in the construction documents and related submittals. Items not considered RFI's are as follows:

a. A request for a proposed alternative materials, products or colors.
b. Substitutions.
c. Coordination of Contractor changed/initiated field conditions.

1.4 CHANGES IN WORK

A. The Owner, without invalidating the Contract may make changes by altering, adding to, or

deducting from the work, the Contract sum and construction duration being adjusted accordingly. All such work shall be executed under the conditions of the original contract. Unless so authorized, the Contractor shall not deviate from nor alter the work as shown on the drawings or specifications. Additional work may be added to project by using project allowances as prescribed herein.

1. In the event additional work is added to the project via allowances the Contractor shall provide an analysis of the schedule impact if any. If additional work is shown to impact the construction schedule the Contractor shall be entitled additional time as agreed to by architect. If additional work is shown by schedule analysis to have no impact, no additional construction duration will added to project.
2. Any changes in construction duration shall be documented by a Change Order to Contract.

B. If Contractor should claim that any instruction, request, drawing, specification, action, condition, omission, default, or other situation constitutes a change, extra work, or otherwise obligates Owner to pay additional compensation to Contractor or to grant an extension of time, or constitutes a waiver of any provision in the Contract Documents, Contractor shall notify Owner in writing of such claim within ten calendar days from the date Contractor has actual or constructive notice of the factual basis supporting the claim. The notice shall state the factual basis for the claim and cite in detail the Contract Documents (including plans and specifications) upon which the claim is based. Contractor's failure to notify Owner and Architect within the ten-day period shall be deemed a waiver and relinquishment of such a claim. If the notice is given within the specified time, the procedure for its consideration shall be as stated in these General Conditions. In the event of failure to agree, the matter shall be treated as a claim following the claims procedures in the Contract Documents.

C. No change shall be made without such authorization, signed by the Owner, and countersigned by the Architect, or signed by the Architect and stating that the Owner has authorized such changes.

1. Refer to Supplementary Conditions for Construction Change Directive (CCD) procedures.
2. Refer to Supplementary Conditions for Supplemental Instructions (SI) procedures.

D. Any changes processed by the Contractor or any work performed not in conformance with these plans and specifications which requires extra drawing, specifications, calculations, inspections and any other work by the Architect and/or Engineers shall be paid for by the Contractor. Payment shall be made to the Architect at current hourly rate on file due and payable upon presentation of invoice.

1.5 CHANGE ORDER PROCESS-(OWNER AND CONTRACTOR INITIATED PROPOSAL REQUEST, AND ALLOWANCES.)

A. Owner-Initiated Proposal Requests: Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the Architect, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.

1. Request for Proposal requests (RFP),issued by the Architect are for information only. Do not consider them an instruction either to stop work in progress, or to execute the proposed change.
2. Unless otherwise indicated in the proposal request, within 20 calendar days of receipt of the proposal request, submit to the Architect for the Owner's review an estimate of cost necessary to execute the proposed change as well as Construction Duration impact.

    a. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Duration.
d. Before Contractor is authorized to proceed with extra work or changes on the basis set forth above, the Owner and the Contractor shall be in complete agreement on what the term "costs" shall include and the amount of overhead and profit the Contractor is to charge.
e. All unit prices, whether set forth in the Contract or subsequently agreed upon, shall include overhead, profit, supervision, increased premium on all Bonds, increased premium on all insurances and other indirect cost for all tiers of contractors and related material men unless said items are being paid thru an allowance where overhead, profit, supervision, bonds, insurance and related items are included in contractor's base bid.
f. If there has been no response within 20 calendar days to an Architect's Request for Proposal, the Architect may direct the change to be done Time and Material. Under no circumstance may the contractor increase cost or increase schedule time due to Owner not receiving proposal timely.

B. Contractor-Initiated Change Order Proposal Requests: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.

1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
2. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Comply with requirements in Supplementary Conditions Article 15 Substitutions if the proposed change in the Work requires the substitution of one product or system for a product or system specified.
5. Claim submitted to the Architect for extensions of time and extra cost shall be made on forms carrying Contractor's letterhead and shall contain a complete breakdown of all costs and extension of Surety Bonds and Insurance impacts.
6. Before Contractor is authorized to proceed with extra work or changes on the basis set forth above, the Owner and the Contractor shall be in complete agreement on what the term "costs" shall include and the amount of overhead and profit the Contractor is to charge as any Contract Duration impacts.

C. All CCDs to be submitted to DSA per IR A-6.

D. For changes that increase or decrease the contract price, or being paid by allowance item, the Contractor shall include the following amounts for overhead and profit:

1. Contractor's overhead and profit on the cost of work excluding work by Contractor shall be a total sum not exceeding ten percent (10%) of cost of such work. (See below for allowances)
2. Contractor's overhead and profit on the cost of work performed by contractor without subcontractor shall be a total sum not exceeding ten percent (10%) of the cost of labor, materials, rentals, etc. (See below for allowances)
3. Subcontractor's overhead and profit on the cost of work performed by subcontractor shall be a total sum not exceeding ten percent (10%) of the cost of labor, materials, rentals, etc.
4. Subcontractor's overhead and profit on the cost of work performed by sub-contractors (one lower tier) shall be a total sum not exceeding five percent (5%) of such work.

5. Allowances: The contractor shall include in his base bid all overhead, profit, supervision, bonds, insurance and all other indirect costs for allowance items. None of these items will be added to lump sum and miscellaneous allowance as it is used by the Owner and directed by the Architect. In the event the allowance is required in an Alternate, the Contractor shall include in his alternate bid all overhead, profit, supervision, bonds, insurance and all other indirect costs for allowance items specific to that alternate.

E. Time and Material basis as changes in the work. For changes that increase the contract price and work is authorized based upon the cost of labor, material, equipment and subcontract prices, plus a percentage for overhead and profit the following requirements shall apply. In the event the costs for changes in the work are not agreed to by the Architect and Contractor the work may be authorized to move forward on a time and material basis. If a Time and Material basis is used and scope of work is being paid thru an allowance overhead and profit are to be included in base bid and alternates where occur.

1. Daily reports by Contractor, as follows:

a. General. At the close of each working day, Contractor shall submit a daily report to the Architect and the Project Inspector on forms approved by Owner, together with applicable delivery tickets listing all labor, materials, and equipment involved for that day, and for other services and expenditures, when authorized, concerning extra work items. An attempt shall be made to reconcile the report daily, and it shall be signed by the Architect and Contractor. In the event of disagreement, pertinent notes shall be entered by each party to explain points which cannot be resolved immediately. Each party shall retain a signed copy of the report. Reports by subcontractors or others shall be submitted through Contractor.

b. Labor. The report shall show names of workers, classifications, and hours worked and hourly rate. Project supervision expenses, including for foremen and above, are not allowed. (iii) Materials. The report shall describe and list quantities of materials used and unit cost.

c. Equipment. The report shall show the type of equipment, size, identification number, and hours of operation, including loading and transportation, if applicable, and hourly/daily costs.

d. Other Services and Expenditures. Other services and expenditures shall be described in such detail as Owner may require.

2. Basis for Establishing Costs

a Labor. The costs of labor will be the actual cost for wages prevailing locally for each craft classification or type of worker at the time the extra work is done, plus employer payments of payroll taxes and insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from federal, state, or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. The use of labor classifications which would increase the extra work cost will not be permitted unless Contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.

b. Materials. The cost of materials reported shall be at invoice or lowest current price at which such materials are locally available and delivered to the work site in the quantities involved, plus sales tax, freight, and delivery. Owner reserves the right to approve materials and sources of supply, or to supply materials to Contractor if necessary for the progress of the work. No markup shall be applied to any material provided by the Owner.

c. Tool and Equipment Rental. No payment will be made for the use of tools which have a replacement value of $100 or less or where an invoice is not provided. Regardless of ownership, the rates to be used in determining equipment rental

costs shall not exceed listed rates prevailing locally at equipment rental sources or distributors at the time the work is performed. The rental rates paid shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals. Necessary loading and transportation costs for equipment used on the extra work shall be included. If equipment is used intermittently, and when not in use could be returned to its rental source at less expense to Owner than holding it at the work site, it shall be returned, unless Contractor elects to keep it at the work site at no expense to Owner. All equipment shall be acceptable to the Architect in good working condition, and suitable for the purpose for which it is to be used. Manufacturer's ratings and manufacturer's approved modifications shall be used to classify equipment and it shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

d. Other Items. Owner may authorize other items which may be required on the extra work. These items include labor, services, material, and equipment which are different in their nature from those required by the work and which are of a type not ordinarily available from Contractor any of the Subcontractors. Detailed invoices covering all such items shall be submitted with the request for payment. (v) Invoices. Vendors' invoices for material, equipment rental, and other expenditures shall be submitted with the request for payment. If the request for payment is not substantiated by invoices or other documentation, Owner may establish the cost of the item involved at the lowest price which was current at the time of the report.

3. Daily worker time sheets shall be approved by the Project Inspector as well as copies of all materials invoices delivered to project site for this specific change. Time sheets and copies of all material costs shall be provided with pay request for this specific change with daily approvals by Project Inspector

F. The following form shall be used by Contractor as applicable to communicate proposed additions and deductions to the Contract Documents and use of allowances:

#	Description	Extra	Credit
a	Materials (attached itemized quantity and unit costs including any sales tax.		
b	Labor (attached itemized hours and rates)		
c	$ Subtotal		
d	Subcontractor's overhead and profit on the cost of work performed by sub-contractors (one lower tier) shall be a total sum not exceeding five percent (5%) of such work.		
e	$ Subtotal		
f	Subcontractor's overhead and profit on the cost of work performed by subcontractor shall be a total sum not exceeding ten percent (10%) of the cost of labor, materials, rentals, etc.		
g	$ Subtotal		
h	Contractor's overhead and profit on the cost of work excluding work by Contractor shall be a total sum not exceeding ten percent (10%) of cost of such work. (Refer to project manual “Allowances” where overhead and profit are included in base bid and alternates where occur)		

i	Contractor's overhead and profit on the cost of work performed by contractor without subcontractor shall be a total sum not exceeding ten percent (10%) of the cost of labor, materials, rentals, etc. . (Refer to project manual "Allowances" where overhead and profit are included in base bid and alternates where occur)		
j	Bond Premium (Submit invoice from Bonding provider) . (Refer to project manual "Allowances" where bond premium are included in base bid and alternates where occur)		
k	Insurance (Submit invoice from Insurance provider) (Refer to project manual "Allowances" where bonds and insurance are included in base bid and alternates where occur)		
l	$ Total		
m	Number of additional days time extension requested due to this time and material change. (Submit as built critical path schedule validating time extension for review and approval)		
	Total Days		
	Subcontractor's labor, material, overhead and profit shall be submitted with documentation in original form as submitted to General Contractor. (Refer to project manual "Allowances" where overhead and profit are included in base bid and alternates where occur)		

G. It is expressly understood that the value of such extra work or changes as determined by any of the methods herein expressly includes any and all of the contractors' costs and expense, both direct and indirect, resulting from delays or additional time required on the project, or resulting from accelerated work to avoid delays to the project.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 012600

CONSTRUCTION REQUEST FOR INFORMATION

DATE: _____ RFI # _____

ATTN: J. Patrick Fogarty
3434 Truxtun Avenue Ste 240
Bakersfield CA 93301

PROJECT: BCSD – Campus HVAC System Upgrade
Pioneer Elementary School

PROJECT#: 566-0017

Subject: _____ Section #: _____
Sheet #: _____

Description: _____

☐ Clarification ☐ Unforeseen Condition ☐ Owner Change ☐ Others

Requesting Sponsor: _____ Approved by: _____

Total number of pages: _____ Contractor: _____

☐ RFI has been reviewed with Project Inspector without resolution

The Architect has 15 business days after written request is received to respond to Request for Information. No delay will be recognized on account of failure of Architect to furnish such interpretations within that period. Partial response or request for clarification of Request for Information constitutes response by Architect. Claims for adjustment shall be made within 10 calendar days after occurrence of the event giving rise to such claim in writing. Date received at Architect's office of signed original claim shall constitute date received. Architect shall be reimbursed by Contractor for time at current hourly rates prevailing to respond to Request for Information that are found to be substantially answered in Construction Documents.

ARCHITECT'S RESPONSE:

☐ RFI not valid ☐ RFI valid

Issued RFI Response #: _____

SECTION 013000 - PROJECT COORDINATION

11/01/16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Divisions 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:

1. Coordination.
2. Administrative and supervisory personnel.
3. General installation provisions.
4. Cleaning and protection.
5. Coordination of allowance items and impacts with base bid scope of work.
6. Coordination of alternate(s) scope of work and impacts with base bid scope of work.

B. Progress meetings, coordination meetings and pre-installation conferences are included in Section "Project Meetings".

C. Requirements for the Contractor's Construction Schedule are included in Division 1, Section "Submittals" and Division 1 Section "Progress Schedules and Reports".

1.3 COORDINATION

A. Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.

1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.
2. Installation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Project Close-out activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials provided by Owner.

1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.

1.4 SUBMITTALS

A. Coordination Drawings: Prepare and submit coordination Drawings.

1. Show the interrelationship of components shown on separate Shop Drawings.
2. Indicate required installation sequences.
3. Comply with requirements contained in Section "Submittals."
4. Refer to Division-21 “Fire Suppression”, 22 “Plumbing”, 23 HVAC” and Division 26 "Electrical" for specific coordination Drawing requirements for mechanical and electrical installations.
5. Attic/Ceiling coordination drawings.

a. Provide attic/ceiling coordination drawings that utilize the available space for efficient installation of the following building components. Coordination meetings shall be held at the project site as the work progresses and adjustments made to coordination drawings with as-built conditions. All Contractors shall coordinate layouts with other disciplines/systems.

1) Mechanical Systems.
2) Plumbing Systems.
3) Electrical Systems.
4) Ceiling Systems.
5) Structural Systems.
6) Fire Sprinkler Systems.
7) Data Cabling Systems.
8) Security Systems.
9) Other Systems.

6. Provide site utility coordination drawings. Refer to project manual Section “Utility Materials” for additional requirements.
7. Roof openings: Provide coordination drawings that verify locations and sizes of roof openings with structural, mechanical, plumbing and electrical drawings as well as actual equipment to be provided.

B. Staff Names: Within 15 days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.

1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.

E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.

F. Recheck measurements and dimensions, before starting each installation.

G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision. Confirm all handicapped mounting heights are in compliance with Title 24 prior to any rough-in work.

3.1 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at final acceptance.

B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious

exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading.
2. Excessive internal or external pressures.
3. Excessively high or low temperatures.
4. Thermal shock.
5. Excessively high or low humidity.
6. Air contamination or pollution.
7. Water or ice.
8. Solvents.
9. Chemicals.
10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.
15. Soiling, staining and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
18. Combustion.
19. Electrical current.
20. High speed operation.
21. Improper lubrication.
22. Unusual wear or other misuse.
23. Contact between incompatible materials.
24. Destructive testing.
25. Misalignment.
26. Excessive weathering.
27. Unprotected storage.
28. Improper shipping or handling.
29. Theft.
30. Vandalism.

END OF SECTION 013000

SECTION 013100 - PROJECT MEETINGS

03/24/16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:

1. Pre-Construction Conference.
2. Pre-Installation Conferences.
3. Progress Meetings.
4. Project Coordination Meetings.

B. Related sections include the following construction schedules are specified in another Division-1 Section.

1. Division 1 Section “Submittals” for construction schedules and related items.
2. Division 1 Section “Progress Schedule and Reports” for construction schedules.

1.3 PRE-CONSTRUCTION CONFERENCE

A. Schedule a pre-construction conference and organizational meeting at the Project site or other convenient location no later than 15 days after Notice to Proceed and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.

B. Attendees: The Owner, Architect, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.

C. Agenda: Discuss items of significance that could affect progress including such topics as:

1. Tentative construction schedule.
2. Critical Work sequencing.
3. Designation of responsible personnel.
4. Procedures for processing field decisions and Change Orders.
5. Procedures for processing Applications for Payment.
6. Distribution of Contract Documents.
7. Submittal of Shop Drawings, Product Data and Samples.
8. Preparation of record documents.
9. Use of the premises.
10. Office, Work and storage areas.
11. Equipment deliveries and priorities.
12. Safety procedures.
13. First aid.
14. Security.

15. Housekeeping.
16. Working hours.
17. TRPA compliance.

1.4 PRE-INSTALLATION CONFERENCES

A. Conduct a pre-installation conference at the site before each construction activity that requires coordination with other construction. The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Architect of scheduled meeting dates.

1. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:

    a. Contract Documents.
    b. Deliveries.
    c. Shop Drawings, Product Data and quality control Samples.
    d. Possible conflicts.
    e. Compatibility problems.
    f. Time schedules.
    g. Weather limitations.
    h. Manufacturer's recommendations.
    i. Compatibility of materials.
    j. Acceptability of substrates.
    k. Temporary facilities.
    l. Space and access limitations.
    m. Governing regulations.
    n. Safety.
    o. Inspection and testing requirements.
    p. Required performance results.
    q. Protection.

2. Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Architect.
3. Do not proceed 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.

1.5 PROGRESS MEETINGS

A. Conduct progress meetings at the Project site at periodic scheduled intervals. Coordinate schedules with the Owner and Architect of proposed meeting dates in advance of meetings. Discuss at Pre-construction meeting. Coordinate dates of meetings with preparation of the payment request such Architect and Project Inspector can discuss any issue with Contractor on project site.

B. Attendees: In addition to representatives of the Owner and Architect, each subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.

C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review

other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.

1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

2. Review the present and future needs of each entity present, including such items as:

    a. Interface requirements.
    b. Time.
    c. Sequences.
    d. Deliveries.
    e. Off-site fabrication problems.
    f. Access.
    g. Site utilization.
    h. Temporary facilities and services.
    i. Hours of Work.
    j. Hazards and risks.
    k. Housekeeping.
    l. Quality and Work standards.
    m. Safety of Students and Staff.
    n. Documentation of information for payment requests.
    o. HCP Impacts on project and work schedules.

D. Reporting: No later than 3 business days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

1. Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.
2. Send Architect, Construction Manager, Project Inspector, and Owner digital files of meeting report and revised schedules.
3. Architect shall provide a copy of field report made during visit to Contractor within 10 days of site visit.

1.6 PROJECT COORDINATION MEETINGS

A. Conduct coordination meetings at the site before each construction activity that requires coordination with other construction. The various Contractors involved in or affected by the installation, and its coordination or integration with other materials and installations shall attend the meeting. Advise the Architect of scheduled meeting dates.

1. Coordination Meetings Schedule (Minimum):

    a. Ceiling/Attic Contractors: The following Contractors shall attend and coordinate construction activities and space requirements:

        1) Mechanical Systems.
        2) Plumbing Systems.
        3) Electrical Systems.

4) Ceiling Systems.
5) Structural Systems.
6) Fire Sprinkler Systems.
7) Data Cabling Systems.
8) Other Systems.

b. Site/Building Utilities Contractors: The following Contractors shall attend the coordination construction activities and space requirements:

1) All Site/Building Utilities Systems.
2) All Site/Building Electrical Systems.
3) All Site/Building Mechanical Systems.
4) All Site/Building Fire Protection Systems.
5) All Site/Building Data Cabling Systems.
6) Other Site/Building Systems.
7) Landscape/Irrigation Site Systems and Requirements Leaching.

2. Record significant discussions and agreements and disagreements of each meeting, along with the approved coordination drawings. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Architect.
3. Do not proceed if the coordination meeting cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the coordination meeting at the earliest feasible date.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 013100

SECTION 013200 - PROGRESS SCHEDULES AND REPORTS

11/01/16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. General: This Section specifies administrative and procedural requirements for the critical path method (CPM) of scheduling and reporting progress of the Work.

1. Refer to General Conditions, Supplementary Conditions and the Agreement, for definitions and specific dates of Contract Time.
2. A Contract Schedule using CPM, with all the elements specified in this Section, is a fundamental and basic requirement for the review and monitoring of the Contractor's successful and timely progress on the Project. The Contract Schedule specified herein shall be provided by the Contractor. The Contractor shall comply with the number of days specified for the Contractor's submission of the Preliminary Contract Schedule consisting of a preliminary precedence diagram, the final Contract Schedule, and the periodic updates during the progress of the Work.

B. Contractors superintendent daily logs, submit weekly as scanned documents.

C. Related Sections:

1. Division 1 Section "Submittals" for submitting schedules and reports.
2. Division 1 Section "Quality Control Services" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Critical path method (CPM) is a construction scheduling technique using Precedence Diagram Method (PDM) to plan and organize construction activities in an orderly manner and to establish the critical path of Work for the timely completion of the Project.

B. Network: A precedence diagram is a graphic representation showing the relationship of activities and events in the correct sequences required to complete the Work within the Contract Time.

C. Activity: An activity is any single identifiable step in the performance of the Work. It is dependent on other activities, and the interrelationship between all activities is the basis of the network analysis and calculation of the critical path.

1. Critical activities are activities with no (zero or negative) total float time and are, therefore, operations that determine the critical path and control completion of the Work.

D. Event: An event is the starting or ending point of an activity and occurs only when all preceding activities have been completed.

E. Float time is the amount of time available for a given activity in excess of its estimated duration. It represents the amount of leeway available in scheduling an activity. Neither Contractor nor

Owner shall have an exclusive right to the use of float. The effects of used float shall be documented by the Contractor on the updated Contract Schedule. Since float time is not for the exclusive use of either party, but is jointly owned, it is a resource available to and shared by both parties as needed to meet the Contract completion date.

1. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
2. Total float is the amount of time an activity can be delayed without adversely affecting overall time for completion of the Work.
3. The earlier time difference from the date of completion of the project as established by the Contractors Schedule and the later time indicated in the Contract Documents shall be considered float time that can be used by either or both Owner and Contractor. While the Contractor may schedule completion of the Project earlier than the date established by the Contract Documents, no additional compensation shall become due the Contractor for the use of float time between the Contractor's projected early completion date and the completion date established by the Contract Documents. The Owner may use this float time for additional work due to Change Orders, use of Allowance funds and Contractors Change Orders that impact the project schedule.

1.4 QUALITY ASSURANCE AND SUBMITTALS

A. Submit references, resume and samples of CPM Consultant's work to the Architect within ten (10) days from date of receipt of Notice of Award.

1. The Consultant shall be a recognized specialist, acceptable to Architect, who is expert in the critical path methods (CPM) of scheduling and reporting.

B. In-House Option: The requirement to retain a Consultant may be waived if the Contractor can demonstrate to the Architect's satisfaction that:

1. It employs skilled personnel who are experienced in CPM scheduling and reporting techniques, and it has the computer equipment required to produce the diagrams.

C. The Contractor or Consultant shall have successfully performed computerized CPM and shall include as evidence at least two projects valued at not less than three-fourths the value of this Project of which at least one project was controlled throughout the duration of the project by means of a computerized, periodic systematic review of the CPM schedule.

1. The Contractor or Consultant shall have computer facilities available that are capable of delivering detailed network diagrams within 48 hours of request.

D. Program: Use latest version of computer software program or approved equal computer software program for network analysis that has been developed specifically to manage CPM construction schedules. Approved programs:

1. Microsoft Project
2. Primavera
3. Prolog

E. Standards: Comply with procedures contained in "CPM in Construction - A Manual for General Contractors", published by the Associated General Contractors of America, Inc. Where procedures listed in this Section are more stringent, comply with the procedures specified in this Section.

F. Designated Representative: Designate the individual responsible for direct control of the Work who has complete authority to act on behalf of the Contractor in fulfilling requirements for the

CPM schedules.

1. Submit, in writing, the individual's qualifications and experience.

1.5 PRELIMINARY PRECEDENCE DIAGRAM

A. Preliminary Precedence Diagram: Within fifteen (15) days of the date of the "Notice to Proceed", submit a preliminary precedence diagram outlining activities for the first ninety (90) days of construction. Include a skeleton diagram for the remainder of the Work with the preliminary precedence diagram.

1. Include each significant construction activity. Coordinate each activity in the network with other activities. Schedule each construction activity in proper sequence.
2. Each activity shall have a start date and a finish date.
3. Include implementation of temporary utilities.

B. Cash Requirement Prediction: With submittal of the preliminary precedence diagram, include a preliminary cash requirement prediction based on all indicated activities.

C. Tabulation of Submittals: With submittal of the preliminary precedence diagram, include a tabulation by date of submittals (Submittal Schedule) required during construction. List those required to maintain orderly progress of the Work, and those required early because of long lead time for manufacture or fabrication. Refer to Division 1 Section "Submittals," for list of products and manufacturers.

D. Distribution: Distribute the preliminary network diagram and Submittal Schedule to all parties that need to know about construction activities that are scheduled early, including the Architect and Owner.

1. Submit seven (7) copies to the Architect.
2. The Architect will review preliminary network diagram and accept or reject it within twenty one (21) days. Submit required revisions within seven (7) days.
3. Submit full software CPM database in format requested by the Architect.

1.6 CONTRACT SCHEDULE

A. General: Prepare a complete Contract CPM Schedule. Proceed with preparation immediately following receipt of Notice to Proceed.

1 Follow the steps necessary to complete development of the Contract Schedule in sufficient time so that the Contract Schedule can be submitted no later than forty-five (45) days after receipt of Notice to Proceed. Upon receipt from Contractor, Architect will review CPM schedule and accept or reject it within twenty-one (21) days. Submit required revisions within seven (7) days.
2 Conduct educational workshops to train and inform key Project personnel, including Installer's personnel, in proper methods of providing data and using CPM scheduling information.
3 Establish procedures for monitoring and updating the Contract Schedule and for reporting progress; coordinate procedures with progress meetings and payment request dates.
4 Provide a network consisting of a logic diagram indicating logical sequencing, duration, overlap factors, and interdependencies of each aspect of the Work.
5 The costs/resources for activities which are to be performed by multiple trades or Installers shall be appropriated and assigned on that basis to each discipline involved.
6 The costs/resources for activities which are to be performed by multiple trades or Installers

shall be appropriated and assigned on that basis to each discipline involved.

B. Contract Schedule Preparation: Prepare a listing of all activities involved in the Work; include every activity having a bearing on the time required to complete the Work. Provide the best data available for generation of the precedence diagram and Contract Schedule.

1. Indicate the time duration, sequence requirements and relationship of each activity in relation to other activities.
2. Indicate times for the following activities to be performed.

    a. Major Contractor-furnished equipment, materials, and building elements, and scheduled activities requiring submittals or Architect's prior approval. Show dates for the submission, review, and approval of each submittal. Dates shall be shown for the procurement, fabrication, delivery and installation of major equipment, materials and building elements, and for scheduled activities designated by the Owner. The Contract Schedule shall include twenty-one (21) days to be allotted for Architect to review each submittal, and twenty-eight (28) days for review by Architect of submittal substitutions.
    b. Scheduled overtime Work.
    c. Dates Contractor requests designated working spaces, storage areas, access and other facilities to be provided by Owner.
    d. Dates Contractor requests orders and decisions from Owner on designated items, including color selections.
    e. Dates Contractor requests Owner-furnished and Owner-procured equipment and utilities.
    f. Implementation of temporary utilities.
    g. Connection and relocation of existing utilities.
    h. Connecting to or penetrating existing structures.
    i. Removal and replacement of movable items, if any.
    j. Demolition.
    k. On-Site samples and mockups.
    l. Inspections and testing.
    m. Calibrations and instrumentations of equipment and included systems.
    n. Corrections of Work, equipment and systems.
    o. Submission and approval of operation and maintenance manuals, record documents and warranties.
    p. Instructions to Owner's personnel in operation and maintenance.
    q. Required activities of Architect.
    r. Restoration of site.
    s. Project closeout procedures.

3. Treat each Phase, each sitework activity, each building, each story, separate area, or Work activity as a separate numbered activity for principal elements, as best fits the Project.
4. Using the preliminary precedence diagram, prepare a skeleton network to identify probable critical paths.
5. A Schedule extending beyond the Contract Time will not be acceptable.
6. A Schedule showing the Work completed in less than the Contract Time may be rejected by Architect if found to be unreasonable.
7. A Schedule showing the Work completed in less than the Contract Time and found by Architect to be reasonable shall be considered to have float, the value of which shall be the difference between the scheduled completion and the Contract completion date. Comply with Article 8 of the General Conditions and Supplementary Conditions.
8. Code the activities in a manner which allows organization of the schedule, and the ability to perform separate sorts for the following areas and for the phases included in Division 1, section - "Summary of Work":

a. Submittals and Procurement.
b. Sitework.
c. By trades.
d. Owner-furnished and Owner-procured items.

9. Any changes to the approved Contract Schedule shall be accompanied by a written explanation as to the impacted portion of the CPM schedule for Architect's review and approval. Additionally, the Contractor shall submit revised precedence diagrams, reports, and other information as deemed necessary by Architect for review.
10. No activity shall be greater than twenty-one (21) days excluding non-construction activities such as procurement, submittals and approvals.

C. Processing: Enter prepared data on the processing system. Process data to produce a computer-generated time-scaled network. Update data, reorganize activity sequences and reproduce as often as necessary to produce the best possible Contract Schedule within the limitations of Contract Time.

D. Format: Display the full network on a stable transparency, or other reproducible media, showing data clearly for the entire construction period.

1. Mark the critical path to clearly distinguish it from non-critical activities.
2. Group activities by area as described in 1.05 B-8.
3. Sheet size: 24" x 36".
4. Provide an executive summary on a single sheet.

E. Initial Issue: Prepare the initial issue of the CPM precedence diagram from a listing of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports to show the following:

1. Contractor or Installer and Work or activity;
2. Principal events of that activity;
3. Early and late start dates;
4. Early and late finish dates;
5. Activity duration in working days;
6. Total float or slack;
7. Size of workforce for each activity, average total size of workforce; and number of work
8. Activity number, description, predecessors, successors, relationship type and lags (if used).

F. Value Summaries: Prepare two (2) cumulative value listings, sorted by finish dates.

1. In first listing, tabulate the following:
   a. Activity number;
   b. Early finish date;
   c. Dollar value;
   d. Cumulative dollar value.

2. In the second listing, tabulate the following:
   a. Activity number;
   b. Late finish date;
   c. Dollar value;
   d. Cumulative dollar value.

3. The cumulative value listings will be used by Architect to assist in determining approval of payment requests. Architect will review and accept or reject cumulative value listings. If rejected, resubmit within seven (7) days.

G. In subsequent issues of both listings, substitute actual finish dates for activities completed as of date of listing.
Prepare listing for ease of comparison with payment requests; coordinate timing with Progress Meetings.
1. In both value summary listings, tabulate "actual percent complete", and "cumulative value completed" with summary totals, as directed by Architect.

H. Submittal and Distribution: Submit the initial issue of the tabulations and network for acceptance. When authorized, distribute copies to the Architect (6 copies),Project Inspector, principal Installers and suppliers or fabricators, College, District, and suppliers or fabricators, and others identified by the Contractor with a need-to-know schedule responsibility.

1. Post copies in the Project Meeting rooms and temporary field office.
2. When updates are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.
3. Submit six (6) copies of each computer-generated report and time-scaled logic diagram plot, and one (1) reproducible copy of time-scaled logic diagram plot to Architect.
4. Submit full software CPM database in format requested by Architect on digital media with one (1) copy to Construction Manager (if applicable) and one (1) copy to Architect.

I. Schedule Updating: Review the Contract Schedule with Construction Manager, if applicable, at each Progress Meeting to incorporate in Contract Schedule all changes in the progress, sequence, and Scope of Work activities.

1. Prepare and submit to Architect an updated Contract Schedule whenever the critical path slips fourteen (14) days, but not less than once a month.

a. The updated Contract Schedule shall accurately represent the as-built condition of all completed and in-progress Work activities as of the date of the updated Contract Schedule.
b. The updated Contract Schedule shall incorporate all changes mutually agreed upon by Contractor and the Owner during preceding periodic reviews and all changes resulting from Change Orders and Field Orders.
c. Contractor shall perform the Work in accordance with the updated Contract Schedule. Contractor may change the Contract Schedule to modify the order or method of accomplishing the Work only with prior acceptance by Construction Manager.
d. Submit narrative report with each schedule update, which shall include, but not be limited to, a description of activities completed and progress made during the past month, a description of problem areas, current and anticipated delaying factors and their impacts, and an explanation of corrective action taken and any proposed revisions for a recovery plan.
e. Submit updated database on acceptable digital media as specified in H-4 above.

J. Contractor shall submit the updated Contract Schedule, in the form acceptable to Architect, at least seven (7) days prior to submitting the Application for Payment.

K. Architect will determine acceptability of the updated Contract Schedule within seven (7) days after its receipt.

L. Progress payments are contingent upon acceptance of the CPM Contract Schedule and its update.

1. Acceptance of the Contract Schedule is a condition precedent to the making of progress payments for Work performed beyond sixty (60) days from receipt of the Notice to

Proceed.

M. The Owner, in their discretion, may deduct the following amounts from each Application for Payment and reduce the Contract Sum for the late submittal of an updated Contract Schedule accepted by the Architect.
   1. An amount of $500 for each day it is late.

N. The accepted, updated Contract Schedule shall be the Contract Schedule of record for the period it is current.

1.7 ADJUSTMENT OF CONTRACT TIME

A. In addition to provisions of the General Conditions and Supplementary Conditions, the Contract Time of the Work will be adjusted in accordance with the following procedures.

B. Any request for an adjustment of the Contract Time for Completion submitted by Contractor for changes or alleged delays shall be accompanied by a complete Time Impact Analysis, which shall be submitted for review within twenty (20) days after the request by Contractor. Time extensions will not be granted unless substantiated by the CPM Schedule, and then not until the CPM Project float becomes zero.

   1. Failure to submit the required Time Impact Analysis within the specified time will be deemed as conclusive evidence of the Contractor's waiver of the requested time extension.

C. Each Time Impact Analysis shall provide information justifying the request and stating the extent of the adjustment requested for each specific change or alleged delay. Each Time Impact Analysis shall be in form and content acceptable to Architect, and shall include, but not be limited to, the following:

   1. A fragmentary CPM type network (Fragnet) illustrating how Contractor proposes to incorporate the change or alleged delay into the current updated Contract Schedule; and
   2. Identification of activities in the current updated Contract Schedule which are proposed to be amended due to the change or alleged delay, together with engineering estimates, worker staffing calculations and other appropriate data justifying the proposal.

D. The Time Impact Analysis shall be determined on the basis of the date or dates when the change or changes were implemented or issued, or the date or dates when the alleged delay or delays occurred.

E. If Architect finds after review of the Time Impact Analysis that Contractor is entitled to an extension of Contract Time, the Contract Time will be adjusted accordingly by Construction Manager, and Contractor shall then update the Contract Schedule accordingly.

1.8 COMPLIANCE WITH SCHEDULE

A. The Contractor and all entities or firms employed by or under the control of the Contractor shall meet the Contract Schedule. The Architect will review the progress of the Work at least once a month. If any Work falls behind the schedule more than ten (10) days for any stage of the Work, the Contractor shall regain the scheduled position within thirty (30) days.

   1. The Contractor shall supply more workers and equipment when necessary to meet the Schedule. Include overtime, weekend, and extra shifts as necessary, without extra cost to the Owner.

2. The Contractor has the responsibility to conduct the Work in accordance with the Contract Schedule and to maintain the accuracy, updating, enforcement and distribution of the Contract Schedule.
3. If the Contractor does not regain the schedule position within the thirty (30) days, the Architect may assess interim liquidated damages.

    a. The maximum amount assessed will be the number of days over the schedule, times the amount of liquidated damages as noted in the "Instruction to Bidders".
    b. If the Owner elects to assess interim liquidated damages, they shall be deducted immediately from the current progress payment, in addition to the amount of the normal retention. The number of days assessed will equal the difference in days between the contractual completion date and the completion date that is projected by the current update of the Contractor's CPM progress schedule or the Architect's forecasted completion date.
    c. If, subsequent to the withholding of such interim liquidated damages, the Contractor is able to proceed so that the projected and contractual dates coincide, the withheld amount will be released to the Contractor.

B. If Contractor is behind schedule by more than ten (10) days for any stage of the Work, based on the updated Contract Schedule after incorporating all approved time extensions, Contractor shall submit to Architect within five (5) days of notification of such delay, a "recovery plan". The recovery plan shall be based on proposed revisions to Contract Schedule for the next sixty (60) day period and shall show how the Contractor intends to bring the Work back on schedule. Recovery plan shall also include a written description of how the measures that the Contractor intends to take without additional cost to Owner shall regain Schedule compliance. The recovery plan activities shall be identified according to their relationship to activities on the accepted Contract Schedule.

    1. Should Contractor fail to submit and execute such recovery plan, the Owner shall have the option to direct Contractor to employ any or all measures that the Owner may deem fit to regain schedule compliance without additional cost to the Owner.
    2. Recovery plan submitted by Contractor, upon acceptance by the Architect, shall be incorporated into the Contract Schedule during the next update.
    3. Contractor will be required to submit a recovery plan for each update that indicated that the Work progress is more than ten (10) days behind schedule.
    4. Should Contractor dispute the determination of the Architect regarding the status on Contract delay, such dispute shall not relieve him/her of the responsibility to comply with the requirements of this Section and other related sections until the dispute is resolved in accordance with the Contract Documents.

1.9 THE OWNER'S DISCLAIMER OF SCHEDULE

A. Acceptance of the Contract Schedule by Architect or the Owner is for general conformity with the requirements of the Contract Documents. Acceptance of the Schedule does not relieve Contractor of responsibility for including all elements of the Work, for the reasonableness of the Schedule, or for the accuracy or suitability of the Schedule to meet the agreed completion or milestone dates.

1.10 THREE WEEK LOOK-AHEAD SCHEDULE

A. Prepare weekly, for the weekly Project Meeting, a computer-generated Three (3) Week Look-Ahead Schedule (barchart) which is consistent with the CPM schedule and depicts daily labor activities. The Three-Week Schedule will consist of the prior week, current week and the following week.

1.11 DAILY CONSTRUCTION REPORTS

A. Prepare a Daily Construction Report in a form acceptable to the Architect.

1. Provide the information requested.
2. Submit two (2) copies at weekly intervals.

B. Contractor's daily diary.

1. Provide copy of any Daily Diaries related to this project by Contractor. Submit at weekly intervals, on digital media to the Architect.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 013200

SECTION 013300 - SUBMITTALS 11/01/16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including, but not limited to,;

1. Contractor's construction project schedule.
2. Submittal schedule.
3. List of products/manufacturers.
4. Shop Drawings.
5. Product Data.
6. Samples.
7. Miscellaneous Submittals.
8. Construction Schedule and updates required for each payment request.
9. Coordination Drawings, specified in Division 1 Section “Project Coordination”.
10. Test reports.

B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

1. Permits/Public Works.
2. Applications for payment.
3. Performance and payment bonds.
4. Insurance certificates.
5. List of Subcontractors.
6. Schedule of Values.
7. DSA Verified Reports.
8. Electronic certified payroll records directly to the Labor Commissioner.
9. Preliminary notices (20-day notice).
10. Procedures for substitutions.
11. TRPA documents

C. Inspection and test reports are included in Section "Quality Control Services."

D. Other submittals:

1. See Division 1 Section "Governing Agency" for DSA Verified Reports to be filed.
2. See Division 1 Section "Project Schedule and Reports," for additional schedule and report requirements

1.3 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

    a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
    b. No color selections will be made until all color samples for entire project have been received by the Architect and determined to be acceptable.

3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for re-submittals.

    a. Allow three weeks for initial review (21 calendar days). Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
    b. If an intermediate submittal is necessary, process the same as the initial submittal.
    c. Allow two weeks (14 calendar days) for reprocessing each submittal.
    d. No extension of Contract Time or claims for additional costs will be approved or authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work and Critical Path Schedule to permit processing requirements indicated herein. Submittals covering component items and forming an interrelated system of items must be coordinated and submitted concurrently rather than individual submittals for review.
    e. Time is defined as calendar days, starting from date item is received in architect's office and end with date of transmittal to General Contractor as last day of review.

        1) Where Submittal is required to be reviewed by consulting Engineer, time to review will be increased by seven (7) calendar days for review.
        2) Where Submittal is required to be reviewed by two parties--i.e., Architect-Engineer, Engineer-Engineer--add fourteen (14) calendar days for review.
        3) The Architects' office is closed from December 16 through January 2 of each calendar year. Submittals received less than 21 calendar days before office closing may not be processed before office closed dates noted herein. The balance of the 21 calendar days will resume after January 2 of each closing for submittals and related items. It is the contractor's responsibility to have critical submittals received by the architect 21 calendar days prior to above closing for timely processing.

            a). Consulting engineering related submittals and re-review items will add time as indicated herein above to the amount of time indicated due to office closing.

    f. Shop drawings, submittals and related items shall be submitted at a time sufficiently early to allow review by the Architect and the Division of State Architect (DSA) if required, and to accommodate the rate of construction progress required under the Contract Documents. Contractor will be required to pay the Architect's reasonable and customary fees to expedite review of shop drawings which are not submitted in timely fashion.
    g. Contractor shall have no claim for damages or extension of time due to any delay resulting from contractor having to make required revisions to shop drawings unless the Architect's review of the drawings is delayed beyond the time provided in the contract documents and contractor can establish that the Architect's delay is review actually resulted in a delay in Contractor's construction schedule. Contractor shall provide a record as built schedule as proof of delays within 10 days of the event that gives rise to a delay claim. Contractor shall not be entailed to any claim for damages resulting from DSA review beyond days allowed herein documents after submittal. However, owner may consider an extension of time due to any delay caused by DSA review.

4. All submittals shall be cross-referenced to contract documents to expedite checking. Use

Project Manual's section designation and Working Drawing's sheet number(s).

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4" x 4" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken. Provide on the label or beside the title block on Shop Drawings to record the Architect's review and approval markings and the action taken.
2. Include the following information on the label for processing and recording action taken.

a. Project name.
b. Date.
c. Name and address of Architect.
d. Name and address of Contractor.
e. Name and address of subcontractor.
f. Name and address of supplier.
g. Name of manufacturer.
h. Number and title of appropriate Specification Section.
i. Drawing number and detail references, as appropriate.

3. Submittals shall be stamped and signed by the Prime Contractor to the effect that the contents have been reviewed and approved by him and meet the requirements for this project. Submittals will not be reviewed without this approval by Prime Contractor. Contractor’s review and approval of shop drawings shall include the following stamp:

a. "Contractor has reviewed and approved not only the field dimensions but the construction criteria and has also made written notation regarding any information in the shop drawings that does not conform to the Contract Documents. This shop drawing has been coordinated with all other shop drawings received to date by Contractor and this duty of coordination has not been delegated to subcontractors, material suppliers, the Architect, or the engineers on this Project.

_____
Signature of Contractor"

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.

1. On the transmittal record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

D. Failure to provide adequate and correct submittals: Contractor shall make a complete and acceptable submittal to the Architect by the second submission of submittals. Owner shall withhold funds due to Contractor to cover additional costs of the Architect’s review beyond the second submission and any other costs incurred by Owner.

1. Architect shall be reimbursed for all time spent in reviewing and processing of re-submittals of any submittals after the second submission where items have not been addressed, corrected and/or providing a complete submittal as requested by architect in previous submissions of a submittal.

E. Submittal quantities:

1. Provide seven (7) copies of all submittals except as follows:

a. Shop Drawings: Provide 4 copies of shop drawings. Architect and Engineer will red line any corrections and retain 4 copies. Contractor will be sent a PDF file of black

and white scanned shop drawing for distribution and printing by Contractor. In the event of corrections and resubmittal contractor shall send 4 corrected copies of Shop Drawings at each resubmittal.

1.4 CONTRACTOR'S CONSTRUCTION PROJECT SCHEDULE

A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart type Contractor's construction project schedule. Identify critical path items throughout project schedule. Submit within 15 days of the award of contract.

1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values".
2. Within each time bar indicate estimated completion percentage in maximum 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.
3. Prepare the schedule on a sheet, or series of sheets of sufficient width to show data for the entire construction period.
4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the project schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the Work.
5. Coordinate the Contractor's construction project schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests and other schedules.
6. Indicate completion in advance of the date established for Final Completion. Indicate Final Completion on the schedule to allow time for the Architect's procedures necessary for certification of Final Completion.

B. Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by requirements for phased completion to permit Work by separate Contractors, partial occupancy by the Owner prior to Final Completion.

C. Work Stages: Indicate important stages of construction for each major portion of the Work, including testing and installation.

D Weather Delays: Contractor shall show anticipated rain, sleet, snow, wind and other weather driven delays on initial project schedule, as separate line items for each weather delay type, based upon Contractor’s proposed ways and means. Refer to Project Manual herein for additional requirements.

E. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.

F. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.

G. Submit with each payment request an updated construction project schedule with the above item plus the following items:

1. As-built project schedule of worked performed to date.
2. Adjusted project schedule showing schedule to complete work.
3. Number of weather delay days and audit of days used for each type of weather delay.
4. Updated Final Completion project schedule dates.

1.5 SUBMITTAL SCHEDULE

A. Prepare a complete schedule of submittals. Submit the schedule within 15 days of Notice to Proceed.

1. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products as well as the Contractor's construction schedule.
2. Prepare the schedule in chronological order. Provide the following information:

a. Scheduled date for each first submittal.
b. Related Section number.
c. Submittal category.
d. Name of subcontractor.
e. Description of the part of the Work covered.
f. Scheduled date for resubmittal.
g. Scheduled date the Architect's final release or approval.

B. Distribution: Following response to initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

C. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.6 LIST OF PRODUCTS/MANUFACTURES

A. Not later than 35 days from the date of the notice to proceed and prior to installation of items, whichever is less, the Contractor shall provide a list showing the name of the manufacturer proposed to be used for each of the products, proposed for installation, and not specified or named in the contract documents including the name of manufacturer of each, for review by the Owner and Architect. The list shall be tabulated by, and be complete for each specification section. Where applicable, subcontractor's names shall be included in such list.

1.7 SHOP DRAWINGS

A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, shop work manufacturing instructions, coordination drawings (for on-site use), design mix information, contractor's engineer calculations, and similar drawings. Include the following information:

1. Dimensions.
2. Identification of products and materials included.
3. Compliance with specified standards.
4. Notation of coordination requirements.
5. Notation of dimensions established by field measurement.
6. Sheet Size: Except for templates, patterns and similar full- size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 36" x 48 (See herein for electronic submittals)".
7. Initial Submittal: Submit one black-line print for the Architect's review; the reproducible print

will be returned, (see herein for electronic submittals).

a. Structural steel, metal deck and miscellaneous steel. Submit black line print and 3 copies for initial submittal.

8. Final Submittal: Submit copies per enclosed requirements.
9. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

C. Coordination drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.

1. Preparation of coordination Drawings include components previously shown in detail on Shop Drawings or Product Data.
2. Submit coordination Drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

1.8 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

a. Manufacturer's printed recommendations.
b. Compliance with recognized trade association standards.
c. Compliance with recognized testing agency standards.
d. Application of testing agency labels and seals.
e. Notation of dimensions verified by field measurement.
f. Notation of coordination requirements.

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
3. Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.
4. Submittals: Submit copies of each required submittal; submit hardcopies where required for maintenance manuals. The Architect will retain one, and will return the other marked with action taken and corrections or modifications required.

a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

5. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.

a. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.
b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.9 MATERIALS SPECIFIED

A. The Contract is based on standards of quality established in the Contract Documents.

1. In agreeing to the terms and conditions for the Contract, the Contractor has accepted the responsibility to verify that the specified products will be available and to place orders for all required materials in such a timely manner as needed to meet his agreed construction schedule.
2. Neither the Owner nor the Architect has agreed to the substitution of materials or methods called for in the Contract Documents, except as they may specifically otherwise state in writing and when approved in advance of purchase and installation per requirements herein.

B. Colors: Provide finish selections indicated in the Project Manual and Plans.

1. Acceptable Manufacturers: The products and manufacturer's specified in the Project Manual and Plans are for purposes of establishing color selection options and quality.
2. Manufacturer's Standard colors and Finishes: Where the Project Manual or Plans specifies a manufacturer's standard color or finish, the Architect makes no guarantee that matching colors or finishes are available as other non-listed manufacturer's "standard colors" from the listing of acceptable manufacturers. The Contractor shall be responsible for providing colors matching those indicated in the Project Manual of listed acceptable manufacturer in the Project Manual at no additional cost.
3. Custom Colors: Where the Finish Schedule Project Manual and or Plan indicates a specific manufacturer's colors, other acceptable manufacturer shall provide matching custom colors where a standard color in not acceptable at no additional cost.

1.10 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, small cuts or containers of materials, color range sets, complete units of repetitively used materials, units of work to be used for independent inspection and testing, and swatches showing color, texture and pattern.

1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match the Architect's Sample. Include the following:

a. Generic description of the Sample.
b. Sample source.
c. Product name or name of manufacturer.
d. Compliance with recognized standards.
e. Availability and delivery time.

2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

a. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 6), that show approximate limits of the variations.
b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.

3. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of full selection, submit three (3) full sets of choices for the material or product.

a. Color selection shall be done upon complete submittal of materials and/or products

needing color selection. It is the responsibility of the general contractor to see to it that required submittals for color selection shall be submitted to the Architect prior to time for implementation to not affect project schedule.

b. Provide ninety (90) days time allowance for the Architect to work out preliminary schemes for College approval from receipt of complete color submittal of all items for this project.

4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 4 sets; one will be returned marked with the action taken.

5. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

b. Sample sets may be used to obtain final acceptance of the construction associated with each set.

B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.

1. Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.

a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.10 MISCELLANEOUS SUBMITTALS

A. Miscellaneous submittals are work related submittals (non-administrative) including warranties, maintenance agreements, workmanship bonds, survey data and reports, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, and similar work related information and materials not process as shop drawings, product data or samples.

B. Inspection and Test Reports: Classify and process each as either "shop drawing" or "product data", depending upon whether report is uniquely prepared for project or a standard publication.

C. Warranties: Refer to "Products" section for specific general requirements on warranties, product/workmanship bonds, and maintenance agreements. In addition to copies desired for Contractor's use, furnish 2 executed copies, plus additional copies where required for maintenance manuals.

D. Standards: Where submittal of a copy of standards is indicated, submit a single copy for Architect's/Engineer's use. Where workmanship at project site and elsewhere is governed by standard, furnish additional copies to fabricators, installers and others involved in performance of the work.

E. Closeout Submittals: Refer to "Project Closeout" section for specific general requirements on submittal of closeout information, materials, tools, and similar items.

F. Schedule of Values: Contractor shall submit Schedule of Values per Instructions to Bidders,. Refer to General Conditions for minimum list of items to be included in Schedule of Values. Changes in Schedule of Values will not be allowed after Notice to Proceed is issued, unless directed by Architect and/or Change Order items which shall carry their own value as a line item on Schedule of Values.

G. Certified Payroll Records: Refer to “Prevailing wage rates and Apprenticeship Requirements” section for specific general requirements.

1. All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement).
2. General Contractor shall provide certification that all requirements for prevailing wage have been made with each application for payment, not limited to paying prevailing wage, documentation of prevailing wage and furnishing electronically to Labor Commissioner.

1.12 ARCHITECT'S ACTION

A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return.

1. Compliance with specified characteristics is the Contractor's responsibility.
2. Numerous serious corrections, or incomplete submittals, will necessitate resubmittal, in which case, only one copy will be returned with notations. Contractor shall resubmit required number of sets with corrections made with original mark-up submittal for review.

B. Conditions of Review: Architect's review is for general conformance with the design concept and contract documents. Review action on a submittal by the Architect does not in any way constitute a change order. Markings or comment shall not be construed as relieving the Contractor from compliance with the project plans and specifications, nor departures therefrom. The Contractor remains responsible for details and accuracy, for conforming an correlating all quantities and dimensions, for selecting fabrication processes for techniques of assembly, and for performing his work in a safe manner.

1. The Contractor is responsible for coordination of his work with and between that of all subcontractors and trades.
2. Absolutely no deviation from the Contract Documents will be permitted without written acknowledgement from Architect of receipt and Review of Written Notification from the Contractor to the Architect accompanying this submittal of all deviations contained in this submittal.
3. The Architect's review is not the final stage of acceptance for any part of the project, nor does it relieve the Contract responsibilities.
4. Contractor shall submit an itemized list of changes of items different than specified/indicated herein and on construction documents. List shall include items that are different and omitted. In the event items are not included on list, omitted from submittal and/or different than specified; Contractor shall be responsible for providing specified item(s). Liabilities subsequent to items omitted/or different shall be the responsibility of Contractor and shall be warranted a minimum of five (5) years or greater as prescribed by law. If no list is included with Shop Drawings, Architect assumes all items are as specified. Items discovered within five (5) years of Notice of Completion shall be corrected and provided by Contractor and Subcontractor at no cost to Owner.

C. Action: The Architect will identify each submittal with a uniform, self-explanatory action sheet. The sheet will be appropriately marked, as follows, to indicate the action taken:

1. No Exceptions Taken: If this box is marked, the work covered by the submittal may proceed provided it complies with the requirements of the contract documents; acceptance of the work will depend upon that compliance.
2. Make Corrections Noted: If box is marked, the work covered by the submittal may proceed provided it complies with both the Architect's/Engineer's notations or corrections to the submittal and with the requirements of the contract documents; acceptance of the work will depend on that compliance. Submit corrected copy for record if requested by the Architect.
3. Revise and Resubmit: If this box is marked, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise the submittal in

accordance with the Architect's/Engineer's notations and resubmit without delay. Repeat if necessary.

4. Rejected: If this box is marked, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise the submittal or prepare a new submittal in accordance with the Architect's/Engineer's notations and resubmit to Architect.

    a. Do not permit submittals marked "Rejected" or, "Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.

5. Action Not Required: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required".
6. Remarks: The review has occasioned comments that have been attached to the submittal. Process these comments as if they had been written on the submittal itself.
7. Requires Intermediate Submittal: Submittal does not meet all requirements for a complete approval. Submittal requires additional information for processing.

1.13 SUBSTITUTIONS

A. Substitution Request:

1. Cost to Contractor or Bidder for review of Substitution Request.

    a. Each review of a Substitution Request by the Architect will be billed to the submitter (Contractor or Bidder) at the current hourly rate on file at Architect's office, two hour minimum for each review, whether approved or rejected.
    b. The Contractor will have a thirty-five (35) day period from the contract award date, in which to review the total contract documentation and issue any substitution or clarification requests to the Architect free of any financial charge.
    c. The Contractor will be expected to identify any omissions, anomalies, divergence or discrepancies in the Contract Documents within this time period and so inform the Architect, in writing.
    d. Any such omissions, anomalies, divergence or discrepancies not identified to the Architect within this period shall be deemed to be included within the bid sum and not subject to a Change Order by the Architect.

        1) The Architect may waive the review cost if, in his sole opinion, the submittal was complete and the time involved in the review was not substantial, and it was in the best interest of the Owner.

2. Content of Request:

    a. Complete the attached Substitution Request Form (at the end of this Section), substantiating compliance of proposed substitution with Contract Documents.
    b. For products, attach to the Substitution Request Form:

        1) Product identification, including manufacturer's name and address.
        2) Manufacturer's literature including product description, performance and complete test data and reference standards.
        3) Samples.

    c. For construction methods, attach to the Substitution Request Form:

        1) Detailed description of proposed methods.
        2) Drawings illustrating methods.

    d. Attach to the Substitution Request Form an itemized comparison of proposed substitution with product or method specified.

e. Provide long-term serviceability data comparing side by side analysis with specified materials.
f. Provide manufacturer's experience in years with product with specific product formulation that is to be substituted.
g. Provide certified warranty issued for this specific project including application--precisely.
h. Provide system component analysis and statement the product is certified by Contractor to be compatible with all other items of assemblies where product/material/method is specified.

3. In making request for substitution, Contractor attests that:

a. Contractor has personally investigated proposed product or method, and determined that it is equal or superior in all respects to that specified.
b. Contractor will provide the same guarantee or warranty for substitution as for product or method specified.
c. Contractor will coordinate installation of accepted substitution into Work, making such changes as may be required for Work to be complete in all respects.
d. Contractor waives all claims for additional costs related to substitution which subsequently become apparent.
e. Contractor will pay all cost of Consultant to interpret physical properties to compare substitution with specified product, if requested by Architect.
f. Colors: The Contractor will match the color and/or finish available for the acceptable manufacturers listed in the Project Manual and/or Plans as a custom color and at no additional cost to the Owner.

4. Submit three (3) copies of Substitution Request prior to submittals required.

B. Acceptance of Substitutions

1. Procedures:

a. The Contract is based on materials, equipment and methods described in the Contract Documents.
b. Architect will consider proposals submitted in accordance with the Substitution Request.
c. Substitutions will be considered when submitted within 35 days after date of Contract.
d. Architect is solely responsible for judging the acceptance of substitutions.
e. Substitute materials, equipment or methods shall not be used unless such substitution has been specifically approved for this Work by the Architect and DSA.
f. Substitutions will not be considered if:

1) They are indicated or implied on product submittals without formal request submitted in accordance with Substitution Request.
2) Acceptance will require substantial revision of Contract Documents.
3) They are submitted more than 35 days after date of Contract, unless the specified or drawing item has been verified to be discontinued or is otherwise unavailable, or the Owner desires a cost savings for the product or system.

g. Substitutions may be subject to DSA approval if Structural Safety, Fire/Life Safety or Accessibility is impacted.

2. Time to review: Architect shall be allowed twenty-eight (28) calendar days to review each substitution submittal. In the event review cannot be completed and more information is requested by the Architect to complete this review, upon receipt of requested information, twenty-eight (28) calendar days will be allowed for additional review after receipt of requested and complete information.

PART 2 - PRODUCTS

2.1 SUBSTITUTION REQUEST FORM

See the form attached to the end of this Section.

PART 3 - EXECUTION

3.1 GENERAL

The attached form will be reproduced by the Contractor or any of his Subcontractors for any and all proposed substitutions. No other forms will be accepted.

SUBSTITUTION REQUEST

DATE: _____ Substitution Request # _____

ATTN: _____ PROJECT: _____

_____ _____

_____ _____

PROJECT#: _____ NOA DATE: _____

We hereby submit for your consideration the following product/ manufacturer instead of the one(s) specified in the Project Manual/ Plans:

Item: _____ Section #: _____

Manufacturer: _____ Sheet #: _____

A. Reason for not providing specified product: _____

B. Proposed Substitution: _____

C. Cost shall be shouldered by the undersigned for changes to the building design, including engineering and detailing costs caused by the requested substitution. (Negative response maybe cause for rejection.)

☐ Yes ☐ No Explain: _____

D. Provide the following with Substitution Request Package:

*NI –Not Indicated; N/A – Not Applicable

		Checklist for Architect			
		Yes	No	N/A	NI
1	Attached data includes product data, specifications, photographs, samples, code approvals and laboratory test data adequate for evaluation of request. All test data shall be complete with relevant test(s).	☐	☐	☐	☐
2	Attach data includes description of change to contract documents that proposed substitution will have. Include complete information on changes to drawing and/ or project manual which proposed substitution will require for proper installation.	☐	☐	☐	☐
3	Does proposed substitution affect dimensions shown on contract documents?	☐	☐	☐	☐
4	Does proposed substitution affect other trades and is it clear on the request form? Provide system component compatibilities.	☐	☐	☐	☐
5	Does proposed substitution affect local availability of service and maintenance including where nearest service representative is located and travel time to project site?	☐	☐	☐	☐
6	Attached cost data with detail breakdown of differential, either plus or minus.	☐	☐	☐	☐
7	If substitution is of higher quality, will this impact future replacement cost?	☐	☐	☐	☐
8	What is the impact of substitution on construction schedule?	☐	☐	☐	☐
9	Provide long term serviceability data compared with specified material.	☐	☐	☐	☐
10	Provide manufacturing experience in years with product with specified material product formation substituted.	☐	☐	☐	☐
11	Provide certified product warranty equal or greater to what is required for this project.	☐	☐	☐	☐
12	Is a consultant required to integrate physical properties to compare material/product?	☐	☐	☐	☐
13	Will the Substitute Manufacturer provide colors matching color selection of listed manufacturers in Project Manual?	☐	☐	☐	☐

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

1. The undersigned will compensate the Architect, Architect's staff, and consulting engineers at Architect's rate per hour for changes required to the building design, including engineering design, detailing, and construction costs caused by the requested substitution. The Architect is herein defined as any of those firms or individuals listed by reference on the Directory, including all Consultants identified herein.
2. Attach all cost data with explanations if different from Specified or Drawing item. Include in that explanation a discussion on quality or proposed substitution and cost differential.
3. Attach all cost data with explanations if different from Specified or Drawing item. Include in that explanation a discussion on quality or proposed substitution and cost differential.
4. The undersigned will pay for any subsequent changes in incorporating the proposed substitution that were not apparent at the time of approval into the Work, including compensation to the Architect and consulting agent(s) as described in item 2 above.
5. The undersigned certifies that the substituted material/product/method is compatible with all the items in the system application's specified use in this project.
6. Failure to provide complete substitution package per above requirements are ground for rejection.

The undersigned states that the function, appearance and quality are equivalent or superior to the construction document item. The undersigned agrees to waive all claims for additional costs related to accepted substitution, including cost associated with changes to building design, engineering, or details, which may subsequently become apparent. (Negative response maybe cause for rejection.)

Submitted by: _____ Approved by General Contractor: _____
Signature

Signature: _____ Signed by: _____ Date: _____
Address: _____ Address: _____

Phone: _____ Fax: _____ Phone: _____ Fax: _____

ARCHITECT'S RESPONSE:

Substitution Request #: _____

Date: _____

Reviewed by: _____

- ☐ Accepted – Submit as construction submittal
- ☐ Accepted as noted – Submit as construction submittal
- ☐ Rejected – Use specified material
- ☐ Received too late – Use specified material

Remarks:

END OF SECTION 013300

SECTION 014000 - QUALITY CONTROL SERVICES 11/01/16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for quality control services.

B. Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include periodic surveillance activities performed by the Architect.

C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.
   1. Inspections, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
   2. Requirements for the Contractor to provide quality control services required by the Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
   3. Refer to Structural Test and Inspection requirements.
      a. Requirements at end of this Section for specific test required for this project.

D. Soil Testing: Inspection of subgrade improvement operations, compacted fill and field density.

E. Concrete Work: Testing and certification of concrete ingredients, compression cylinders, reinforcing steel and placement inspections.

F. Structural Steel: Sampling and testing of all unidentified steel members, inspection of structural fabrication, shop welding and field welding as required, testing and inspection of high strength bolts.

G. Related work specified elsewhere:
   1. Division 31 Section "Earthwork" for requirements and related earthwork testing.
   2. Division 3 Section "Cast-in-Place Concrete" for requirements and related concrete testing & inspection.
   3. Division 5 Section “ Structural Steel” for requirements and related steel testing.
   4. Division 5 Section “Cold-Form Metal Framing” for requirements and related steel testing.

H. Drill-in (expansion and chemical adhesive) Anchors: Inspection of installation and tension testing.

1.3 COOPERATION

A. Laboratory shall cooperate with all trades whose work affects or is affected by the tests and inspections.

B. Cooperation: Contractor to cooperate with and provide testing laboratory opportunity and assistance in taking samples, making field tests and making inspections.

1.4 SPECIAL PROVISIONS

A. Governing Agency: Shall be as specified in Section 014300.

B. Laboratory: A DSA accepted testing laboratory directly employed by the District (Owner) shall conduct all the required tests and inspections for the project. .

C. Duties of Testing Laboratory: Inspect stock, mark identified stock, select and mark test specimens, perform required tests, inspections as specified, furnish required reports and certificates.

D. Reports: To be executed immediately upon conclusion of each procedure and forwarded to:
Architect - Structural Engineer - Contractor - Owner - Subcontractor - Job Inspector - Governing Agency
1. The Division of the State Architect is the Governing Agency for this project, one copy of all test reports shall be forwarded to that Office by the testing agency. Such reports shall include all tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. The reports shall show that the material or materials were sampled and tested in accordance with the requirements of 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.
2. Verification of Test Reports: Each testing agency shall submit to the Division of the State Architect a verified report in duplicate covering all of the tests which are required to be made by that agency during the progress of the project. Such report shall be furnished each time that work on the project is suspended, covering the tests up to that time, and at the completion of the project, covering all tests.

E. Payment: The Owner shall pay for all tests, except costs of concrete mix design. When, in the opinion of the Architect or the Division of the State Architect, additional tests are required, then such tests and inspection shall be paid for by the Owner but the amount paid shall be deducted from the Contract Price. Examples of such additional tests are: Tests of material substituted for previously accepted materials, unidentified materials, retests made necessary by the failure of materials to comply with the requirements of the specifications and load tests necessary because certain portions of the structure have not fully met specification or plan requirements.
1. Travel to Shop Fabrication Facility: Where fabrication facility is more than 200 driving miles one way, using AAA maps, from project site, Contractor shall pay for all excess mileage charges over 200 miles one way, subsistence, lodging and drive time of Owner's inspection and testing team to do testing and inspection at fabrication facility.
2. All testing and inspection work provided by Laboratory shall be done during normal working hours, (none premium). In the event over time and or premium time is required by the Laboratory, field and or laboratory time, due to contractor request and or contractor scheduling, all costs over normal time shall be paid by contractor. Laboratory shall identify costs as a separate invoice and all costs tracked for reimbursement to Owner by Contractor. Laboratory shall identify who approved premium costs and reason for each line item on invoice.

F. Selection of Samples: All samples and specimens for testing shall be selected by the inspector or by the testing laboratory, but not by the Contractor. The Contractor shall, at his own expense, furnish, package, mark and deliver all samples to be tested, when so directed by the inspector, testing laboratory, or as required by the Specifications. Delivery of samples to the testing laboratory shall be made in ample time to allow tests to be made without delaying construction. No extra time will be allowed for the completion of the work by reason of delay in testing samples. The Contractor shall allow free access at all times to the representatives of the testing laboratory to the sources from which samples are taken.

G. Preparation of Specimens: Taken by and at expense of fabricator under direction of testing laboratory and machined or prepared to conform to appropriate ASTM specification. Cost of machining specimens is considered part of the testing.

H. Architect and Structural Engineer reserve(s) the right to demand for test and special examination any

materials or part thereof to insure compliance with Specifications, and may reject for satisfactory replacement, any material or part judged defective as a result thereof. Applies also to materials or sources of the same substituted for those previously approved. Such tests or examinations, even though not specified, shall be performed as and when required. Costs paid for by Owner, but the amount paid shall be deducted from the Contract.

I. Owner's Right to Waive Tests and Inspections: The Owner reserves the right to waive any part or all of the tests and inspections, subject to the approval of the Architect, Structural Engineer and DSA in writing.

1.5 OWNER'S INSPECTOR OF RECORD (PROJECT INSPECTOR)

A. A DSA certified project inspector employed by the Owner and approved by DSA in accordance with the requirements of the State of California Code of Regulation, Title 24, Part 1, Administrative Code, will be assigned to the work. His duties are specifically defined in Sec 4-342.

B. The work of construction in all stages of progress shall be subject to the personal continuous observation of the inspector. He shall have free access to any or all parts of the work at any time. The Contractor shall furnish the inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed respecting the progress and manner of the work and the character of the materials. Inspection of the work shall not relieve the Contractor from any obligation to fulfill this Contract.

1. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:

   a. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
   b. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
   c. Providing facilities for storage and curing of test samples.
   d. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
   e. Security and protection of samples and test equipment at the Project site.

2. One or more Inspectors, including specialty Inspectors as required, employed by Owner in accordance with the requirements of the California Code of Regulations will be assigned to the work. All work shall be performed under the observation of or with the knowledge of the Project Inspector. The Project Inspector shall have free access to all parts of the Work at any time. Contractor shall furnish the Project Inspector with such information as may be necessary to keep the Project Inspector fully informed regarding the progress and manner of work and the character of materials.
3. Observations by the Project Inspector shall not in any way relieve Contractor from responsibility for full compliance with all terms and conditions of the Contract Documents, or be construed to lessen to any degree Contractor’s responsibility for providing efficient and capable superintendence.

1.6 DUTIES OF THE TESTING AGENCY

A. The independent testing agency approved by DSA engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Architect and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.

1. The agency shall notify the Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
3. The agency shall not perform any duties of the Contractor.

B. Coordination: The Contractor and each agency engaged to perform inspections; tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities during normal working hours, none premium time for Laboratory of Record including field, office and off site laboratory time.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for "Cutting and Patching."

B. Protect construction exposed by or for quality control service activities, and protect repaired construction.

C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

3.2 CONCRETE WORK (REFER TO SECTION 033000)

A. Inspections:

1. Notification: The Contractor shall notify the following people, giving advance notice prior to commencing the designated work:

Person Notified	Advance Notice	Prior to Commencing	For Inspection
Architect/Project Inspector	24 hours	Form Work	Excavation
Architect/Project Inspector	48 hours	Pouring Conc.	Forms & Steel
Structural Engineer	7 days	Casting Concrete	Forms & Steel

2. No concrete shall be poured except in the presence of the Owner's Inspector and only after the forms and reinforcing steel have been approved by the Project Inspector. A record shall be kept on the site of the time and date of placing the concrete in each portion of the structure. Such record shall be kept until the completion of the structure and shall be open to the inspection of the enforcement agency.
3. Batch Plant Inspections: Batch plant inspections shall be per CBC Sec. 1705A.3.3. When transit mixed concrete is used, continuous inspection shall be maintained at the plant by a qualified concrete technician who shall issue tickets certifying that quantities and quality of all materials used in the concrete are in accordance with these specifications and the approved design mix.

The Owner will pay the costs of this inspection. This inspection will not be required for non-structural concrete (as defined in Paragraph (4) following).

4. Bonded Weighmaster Certificates: Non-structural concrete such as walks, curb and gutter, etc., shall not require continuous batch plant inspection, but instead, a bonded weighmaster shall furnish notarized affidavits certifying that quantities and quality of all materials used in the concrete are in accordance with these Specifications and the approved mix design. Comply with CBC 1916A and 1704A.4.3.

   a. Copies of Bonded Weighmaster Certificates shall be submitted to the Architect along with pay requests for work done. Payment will not be made on non-structural concrete items poured requiring Bonded Weighmaster Certificates without receipt of Certificates of items poured requesting payment.

B. Tests: All concrete materials to be tested and reported prior to any use of same.

1. Portland cement shall be tested in accordance with CBC, 1705A.3, 1910A.1 and ASTM C-150. The concrete supplier shall submit to the Architect, Structural Engineer, Project Inspector, Project Testing Laboratory and Division of State Architect certification of compliance based on required testing.
2. Aggregate: Shall be in conformance with CBC Sec. 1705A.3, 1910A.1, ACI 318, Section 3.3.2 and, where the source is determined to be questionable by the Structural Engineer or by DSA, shall be tested in accordance with ASTM C289. Test samples shall be obtained from the source for both coarse and fine aggregate; a minimum of one sample shall be retrieved and tested for each 200 Tons of aggregate to be used in the project concrete. A qualified Laboratory that is certified by the Cement and Concrete Reference Laboratory shall perform the testing.
3. Reinforcing Steel: To be tested prior to use for compliance with CBC Sections 1910A.2 and ASTM A-615/706 requirements.

   a. Samples: To be selected by representative of testing laboratory from material at the building site or place of distribution, to consist of two (2) pieces, each eighteen inches (18") long of each size, furnished, cut and prepared for testing by Contractor, marked and delivered by representative of testing laboratory.
   b. Tests: One (1) tension and one (1) bend test shall be made of each size of reinforcing steel including wire fabric. One (1) series of tests shall be made for each ten (10) tons or fraction thereof of each size of reinforcing steel if the bundles, as delivered, can be identified as to heat number and the mill analysis, accompany the report. If they cannot be identified as to heat number, then one (1) series of tests shall be made from each two and one-half (2½) tons or fraction thereof.

4. Cylinder Tests shall comply with CBC Sec. 1905A.1.15.

   a. Four (4) cylinders of concrete shall be made for each fifty (50) cubic yards of each grade concrete, or not less than once for each 2000 sq.ft. of slab or fraction thereof, being placed each day. Each cylinder shall be dated, given a number, the point in the structure from which the sample was taken noted thereon, and the slump noted thereon. Comply with CBC 1905A.
   b. Test cylinders shall be made at the job and stored in the testing laboratory in accordance with ASTM C-31. At the end of twenty-four (24) hours after making, the cylinders shall be stored under moist curing conditions at approximately 70 degrees F. and maintained therein until tested. The cylinders shall be tested in accordance with CBC 1905A.6 and ASTM C-39.

   c. If the strengths of the first two cylinder tests are satisfactory, the third cylinder shall not be tested, but destroyed. The third cylinder shall be tested if the strengths of the first two cylinders are not satisfactory.

d. If the strength of the cylinders does not meet the minimum as mentioned above, core tests of the hardened concrete shall be made in accordance with CBC 1905A.6 and ASTM C-42. If the core tests show the concrete strength to be deficient, the concrete shall be deemed defective and removed. The Contractor shall reimburse all costs of these core tests with a negative Change Order.

C. Laboratory-Designed Mixes: See Paragraph 2.5, Proportioning and Design of Mixes, Section 033000 and CBC 1705A.3.

3.3 STRUCTURAL STEEL (REFER TO SECTION 051200)

A. Inspections: All structural welding, both shop and field welding shall be done under the review of a certified welding inspector, qualified in accordance with DSA I.R.17-3, the American Welding Society, as approved by the Architect, Structural Engineer and the Governing Agency. The inspector shall furnish the Architect, Structural Engineer and Governing Agency a report on forms supplied that the welding, which is required to be inspected, is proper and has been done in conformity with AWS D1.1 and the Plans and Specifications. He shall check the material, equipment and procedure as well as the welds and the ability of the welder. The welding inspector shall be employed by the testing laboratory. Inspection of welding shall be according to DSA I.R.17-3 and CBC Section 1705A.2.5.

1. Inspection of high-strength bolt installations shall be made in accordance with CBC Sec. 1705A.2.1 by an inspector specially approved for that purpose by the enforcement agency. The inspector shall check the materials, equipment, and details of construction and installation procedure.

3.4 FASTENERS (REFER TO SECTION 061000)

A. Powder Driven Concrete Anchors:

Powder Driven and Gas Actuated Concrete Anchors: The operator, tool, and fastener shall be pre-qualified by the project inspector. He shall observe the testing of the first ten (10) fastener installations. A test "pull-out" load of 200 pounds shall be applied to the pin in such a manner as not to resist the spalling tendency of the concrete surrounding the pin. Thereafter, random tests under the project inspector's supervision shall be made of approximately one in ten (1 in 10) pins. Should failure occur on any pin tested, all installations must be tested and failing pins replaced.

B. Expansion Anchors: (Refer to Section 061000)

Expansion Anchors: Expansion anchors shall only be used for equipment anchorage, sill trackbolting and non-structural applications. Expansion anchors shall be installed in accordance with the ICC ES Report for the specific product and T.24 Sec 1905A.1.8. Expansion anchors used for sill tracks and for non-structural applications shall have 50% of the bolts (alternate bolts in any group arrangement) proof tested in tension to twice the allowable tension load. If any failures occur, all anchors not previously tested shall be tested until 20 consecutive anchors pass the test requirements. For all other structural applications, test 100% of anchors.

1. All expansion anchors shall be proof tested in tension to the values on the construction documents.
2. Anchor diameter refers to the thread size for the WEDGE & SHELL categories and to the anchor outside diameter for the SLEEVE category.
3. Apply proof test loads to WEDGE & SLEEVE anchors without removing the nut if possible. If not, remove nut & install a threaded coupler to the same tightness of the original nut using a torque wrench apply load.
4. For SLEEVE/SHELL internally threaded categories, verify that the anchor is not prevented from withdrawing by a baseplate of other fixtures. If restraint is found, loosen and shim or remove

fixture(s) prior to testing.

5. Reaction loads from test fixtures may be applied close to the anchor being tested, provided the anchor is not restrained from withdrawing by the fixture(s).
6. SHELL type anchors should be tested as follows:
   Visually inspect 25% for full expansion as evidenced by the location of the expansion plug in the anchor body. Plug location of a fully expanded anchor should be as recommended by the manufacturer, or, in the absence of such recommendation, as determined on the job site following the manufacturer's installation instructions, and; proof load 5% as indicated in the table above, but not less than three anchors per day for each different person or crew installing anchors, or; test 50% of the installed anchors per CBC Sec. 1916A.8.
7. Test equipment is to be calibrated by an approved testing laboratory in accordance with standard recognized procedures.
8. Torque test values for SHELL type anchors are omitted due to lack of data. Torque testing can occur on an individual basis when test procedures are submitted and approved by the enforcement agency. Tabulated values may be forthcoming once the enforcement agency has more data to evaluate the feasibility of standard torque values.
9. The following criteria apply for the acceptance of installed anchors:
   HYDRAULIC RAM METHOD: The anchor should have no observable movement at the applicable test load. For wedge and sleeve type anchors, a practical way to determine observable movement is that the washer under the nut becomes loose.
   TORQUE WRENCH METHOD: The applicable test torque must be reached within the following limits;
   Wedge or Sleeve type: One-half (1/2) turn of the nut.
   One-quarter (1/4) turn of the nut for the 3/8 in. sleeve anchor only. If the anchor fails testing, test all anchors of the same category not previously tested until twenty (20) consecutive pass, then resume the initial testing frequency.
10. Testing should occur 24 hours minimum after installation of the subject anchors.

C. Automatic End-Welded Studs: Inspection, in accordance with Title 24, Section 1704A.3.3 of all the shop and field welding operations for the automatic end welded studs shall be made by a qualified welding inspector (approved by the Division of the State Architect). The type and capacity of the welding equipment shall be in accordance with the manufacturer's recommendations and shall be checked and approved by a welding inspector.

   At the beginning of each day's work, a minimum of two test stud welds shall be made with the equipment to be used to metal, which is the same as the actual work piece. The test studs shall be subjected to a 90% bend test by striking them with a heavy hammer. After the above test, the weld section shall not exhibit any tearing out or cracking.

   Testing of end-welded studs shall be in accordance with Section 2212A.3, Part 2, Title 24.

D. Adhesive Anchors (Refer to Section 061000)

   1. Inspection: Special inspection, in accordance with the product's specific ICC –ES Report, is required for all adhesive anchors. Such inspection shall include but not be limited to verification of the following:

      a. Drill-bit compliance.
      b. Hole depth and cleanliness.
      c. Product description, including name.
      d. Rod diameter, length, embedment, material and condition.
      e. Adhesive shelf life not expired and packaging in good condition.
      f. Anchor installation in accordance with the manufacturer's published instructions, the ICC report, and the project drawings and specifications.
      g. Ambient temperature restrictions not exceeded.

2. Testing: All adhesive anchors, unless otherwise noted, shall be direct-tension tested to 200% of their allowable loads.

3.5 TEST AND INSPECTION REQUIREMENTS PER DSA (WHERE APPLICABLE COORDINATE WITH DSA-3)

TITLE 24,PART 2 (2019 CBC) VOLUME 1
TESTS AND INSPECTION REQUIREMENTS

EXTERIOR WALL COVERINGS
CHAPTER 14A

ROOFING & ROOF STRUCTURES
CHAPTER 15

SITE WORK.DEMOLITION & CONSTRUCTION
CHAPTER 33

INSPECTION:

1. EXCAVATION AND FILLS	1704A.7

TITLE 24,PART 2 (2019 CBC) VOLUME 2
TESTS AND INSPECTION REQUIREMENTS

FOUNDATIONS
CHAPTER 17A & 18A

CONCRETE
CHAPTER 17A & 18A

MATERIALS:

1. PORTLAND CEMENT	1705A.3, 1910A.1
2. CONCRETE AGGREGATES	1705A.3, 1910A.1
3. REINFORCING BARS	1910A.2

QUALITY:

1. PROPORTIONS OF CONCRETE	1705A.3
2. STRENGTH TESTS OF CONCRETE	1905A.1.15
3. SPLITTING TENSILE TESTS	1905A

INSPECTION:

1. JOB SITE	1905A.7

STEEL
CHAPTER 22A

END OF SECTION 014000

SECTION 014200 - REFERENCE STANDARDS AND DEFINITIONS 10/30/13

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

A. General: Basic contract definitions are included in the Conditions of the Contract.

B. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings; or to other paragraphs or schedules in the Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference. Location is not limited.

C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Architect, requested by the Architect, and similar phrases.

D. "Approved": The term "approved," when used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.

E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": The term "furnish" means to supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations. New items unless noted otherwise in technical section.

G. "Install": The term "install" describes operations at the Project site including the actual unloading, temporary storage at project site until required, unpacking, assembling, erecting, place secure and connect, anchoring, applying, working to dimension, furnish required appurtenances to complete installation, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use, including required appurtenances to make a complete operating system/installation.

I. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.
2. Trades: Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to

tradespersons of the corresponding generic name.

3. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.

    a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.

J. "Project site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

K. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

L. Nominal/Net: Nominal dimensions shall be industry standard dimensions--i.e., 2x4 shall be 1-1/2" x 3-1/2" actual dimensions. Plans will not indicate (") marks for nominal dimensions--i.e., 3"x6" and plans will indicate (") after each number which means actual net dimension required for member(s) indicated.

M. Section: Refers to a section of this project manual.

N. Standards: The issue in effect as of the date of the project manual and construction documents. In the event of a conflict between either, the more restrictive date will prevail.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on the 33-division format and CSI/CSC's "MasterFormat" numbering system.

B. Specification Content: These Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

    a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

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

B. Publication Dates: Comply with the standards in effect as of the date of the Contract Documents.

C. Conflicting Requirements: Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different but apparently equal to the Architect for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.

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

1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source and make them available on request.
2. Current standards shall be standard in effect as of date of project manual.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade & Professional Associations of the U.S.," which are available in most libraries.

F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following abbreviations and acronyms, as referenced in the Contract Documents, mean the associated names. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association 900 19th St., NW, Suite 300 Washington, DC 20006	(202) 862-5100
AABC	Associated Air Balance Council 1518 K St., NW, Suite 503 Washington, DC 20005	(202) 737-0202
ACI	American Concrete Institute P.O. Box 9094 Farmington Hills, MI 48333	(810) 848-3700
ACPA	American Concrete Pipe Association 222 West Las Colinas Blvd., Suite 641 Irving, TX 75039-5423	(214) 506-7216

ADC	Air Diffusion Council 11 South LaSalle St., Suite 1400 Chicago, IL 60603	(312) 201-0101
AGA	American Gas Association 1515 Wilson Blvd. Arlington, VA 22209	(703) 841-8400
AI	Asphalt Institute Research Park Dr. P.O. Box 14052 Lexington, KY 40512-4052	(606) 288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006-5292	(202) 626-7300
AISC	American Institute of Steel Construction One East Wacker Dr., Suite 3100 Chicago, IL 60601-2001	(312) 670-2400
AITC	American Institute of Timber Construction 7012 S. Revere Pkwy, Suite 140 Englewood, CO 80112	(303) 792-9559
ANSI	American National Standards Institute 11 West 42nd St., 13th Floor New York, NY 10036-8002	(212) 642-4900
APA	APA-The Engineered Wood Association (Formerly American Plywood Association) P.O. Box 11700 Tacoma, WA 98411-0700	(206) 565-6600
ARA	American Registered Architects 305 E. 46th Street New York, NY 10017	(818) 995-6177
ARI	Air-Conditioning and Refrigeration Institute 4301 Fairfax Dr., Suite 425 Arlington, VA 22203	(703) 524-8800
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329-2305	(800) 527-4723 (404) 636-8400
ASTM	American Society for Testing and Materials 100 Barr Harbor Dr. West Conshohocken, PA 19428-2959	(610) 832-9500
AWS	American Welding Society 550 LeJeune Rd., NW Miami, FL 33126	(305) 443-9353

BHMA	Builders Hardware Manufacturers Association 355 Lexington Ave., 17th Floor New York, NY 10017-6603	(212) 661-4261
CEC	California Electrical Code (Available from NFPA)	
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Rd. Schaumburg, IL 60195	(800) 465-2774
CTI	Ceramic Tile Institute of America 12061 West Jefferson Blvd. Culver City, CA 90230-6219	(310) 574-7800
DHI	Door and Hardware Institute 14170 Newbrook Dr. Chantilly, VA 22021-2223	(703) 222-2010
DSA	Division of the State Architect 1102 Q Street Suite 500 Sacramento, CA 95811	(916) 445-8100
DSA	Division of the State Architect 700 N. Alameda St. Suite 5-500 Los Angeles, CA 90012	(213) 897-0950 (SE) (213) 897-0744(AC) (213) 897-2891 (FLS)
DSA	Division of the State Architect 10920 Via Frontera Suite 300 San Diego, CA 92127	(858) 674-5435 (SE) (858) 674-5415 (AC) (858) 674-5439 (FLS)
EIMA	EIFS Industry Members Association 402 N. Fourth St., Suite 102 Yakima, WA 98901-2470	(509) 457-3500
FM	Factory Mutual 1151 Boston-Providence Tnpk. P.O. Box 9102 Norwood, MA 02062	(617) 762-4300
FS	Federal Specification Unit (Available from GSA) 470 East L'Enfant Plaza, SW, Suite 8100 Washington, DC 20407	(202) 755-0325
GA	Gypsum Association 810 First St., NE, Suite 510 Washington, DC 20002	(202) 289-5440
MFMA	Maple Flooring Manufacturers Association 60 Revere Drive Suite 500 Northbrook, IL 60062	(847) 480-9138
NECA	National Electrical Contractors Association 3 Bethesda Metro Center, Suite 1100	

	Bethesda, MD 20814-5372	(301) 657-3110
NFPA	National Fire Protection Association One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101	 (617) 770-3000 (800) 344-3555
NRCA	National Roofing Contractors Association O'Hare International Center 10255 W. Higgins Rd., Suite 600 Rosemont, IL 60018-5607	 (847) 299-9070
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor) 200 Constitution Ave., NW Washington, DC 20210	 (202) 219-8148
PCA	Portland Cement Association 5420 Old Orchard Rd. Skokie, IL 60077-1083	 (847) 966-6200
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association, Inc. 4201 Lafayette Center Dr. P.O. Box 221230 Chantilly, VA 22022-1209	 (703) 803-2980
SSPC	Steel Structures Painting Council 4400 Fifth Ave. Pittsburgh, PA 15213	 (412) 281-2331
TCNA	Tile Council of North America, Inc. 100 Clemson Research Blvd. Anderson, SC 29625	 (864) 646-8453
UL	Underwriters Laboratories Inc. 333 Pfingsten Rd. Northbrook, IL 60062	 (847) 272-8800
WCLIB	West Coast Lumber Inspection Bureau P.O. Box 23145 Portland, OR 97281-3145	 (503) 639-0651
WI	Woodwork Institute 3188 Industrial Blvd. West Sacramento, CA 95691	 (916) 372-9943

1.5 SUBMITTALS

A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 014200

SECTION 014300 - GOVERNING (REVIEWING AND APPROVING) AGENCY 11/01/16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes, but is not limited to, the following:

1. DSA Reports.

1.3 GOVERNING (REVIEWING AND APPROVING) AGENCY

A. The Governing (Reviewing and Approving) Agency for this project shall be:

BAKERSFIELD CITY SCHOOL DISTRICT
AND DIVISION OF THE STATE ARCHITECT
STRUCTURAL SAFETY SECTION (DSA/SSS)
ACCESS COMPLIANCE (DSA/ACS)
FIRE LIFE SAFETY (DSA/FLS)

B. The Governing (Reviewing and Approving) Agency for offsite improvements:

Kern County

1.4 STATE LAWS AND REGULATIONS

A. The project shall be constructed under the complete jurisdiction of all laws of the State of California governing the construction of public buildings, to wit:

1. 2019 Title 24, Parts 1, 2, 3, 4, 5 & 9 of the California Code of Regulations.
2. All laws governing the employment of labor, qualifications for employment, posting of minimum wage rates, hours of work, employment of aliens, payment for employees, convict-made materials, domestic and foreign materials and accident prevention.
2. Public Health Code of California State Department, of Public Health.
3. Title 19 of the California Code of Regulations entitled “Public Safety”, Chapter 1, State Fire Marshal, Subchapter 1, “General Fire and Panic Safety”.
5. General Industrial Safety Orders: Each and every Contractor shall observe and conform to the provisions of Title 8, California Administrative Code bearing upon safe and proper use, construction, disposal, etc., of materials, machinery and building appurtenances as therein set forth.
6. Code Rules and Safety Orders: All work and materials shall be in full accordance with the latest rules and regulations of the State Fire Marshal; the safety orders of the Division of Industrial Safety, Department of Industrial Relations, and any State

Laws or Ordinances. Nothing in these plans and specifications is to be construed to permit work not conforming to these codes.

7. National Board of Fire Underwriters.
8. Occupational Health and Safety Act. (OSHA)

All of the above laws and regulations, through referral herein, are as much a part of the Contract as if they were incorporated in their entirety in this Section.

1.5 LAWS TO BE OBSERVED

A. The Contractor shall keep himself fully informed of all existing and future State and Federal laws and county and municipal ordinances and regulations which in any manner affect those engaged or employed in the Work, or the materials used in the Work, and of all such ordered and decrees of bodies or tribunals having any jurisdiction or authority over the Work. He shall at all times observe and comply with, and shall cause all his agents and employees to observe and comply with all existing and future laws, ordinances, regulations, orders and decrees of bodies or tribunals having any jurisdiction or authority over the Work.

Should the Contractor claim that additional cost is involved because of any change in the law, regulation, code or ordinance, he shall make a claim as provided herein.

1. Contractor shall be licensed and regulated by the Contractors' State License Board pursuant to Business and Professions Code S7000 et seq.
2. Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the Contract shall forthwith be physically amended to make such insertion or correction.
3. Contractor shall not be compensated for additional costs incurred due to changes in laws, regulation, code or ordinances made before date of project bid date, only those after bid date and approved by the Architect.

1.6 TESTS AND INSPECTIONS

A. Tests and Inspections shall be in accordance with Title 24 Part 1 & 2 and as specified herein.

B. The Architect or Structural Engineer in general responsible charge shall designate the testing of materials consistent with the needs of the project and shall issue specific instructions to the testing agency.

PART 2 - PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 014300

SECTION 015000 - TEMPORARY FACILITIES

02/02/16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.

B. Temporary utilities required include but are not limited to:

1. Water service and distribution
2. Temporary electric power and light
3. Telephone service
4. Storm and sanitary sewer
5. Temporary fire alarm
6. Temporary security alarm

C. Temporary construction and support facilities required include but are not limited to:

1. Temporary heat
2. Field offices and storage sheds
3. Sanitary facilities, including drinking water
4. Dewatering facilities and drains
5. Temporary enclosures
6. Temporary HVAC - fresh air
7. Temporary Project identification signs and bulletin boards
8. Waste disposal services
9. Construction aids and miscellaneous services and facilities
10. Temporary access to occupied buildings
11. Temporary signs indicating building access during construction
12. Temporary roof and envelope of building
13. Temporary storage containers for Owner's use during construction
14. Storm water prevention measures
15. Temporary construction fence around buildings as required to secure and buildings and related work.
16. Temporary access ramps to building
17. Temporary access to buildings
18. Dust control measures

D. Security, protection and miscellaneous facilities required include but are not limited to:

1. Temporary fire protection
2. Barricades, warning signs, lights
3. Enclosure fence at buildings

4. Environmental protection
5. Enclosure fence at site work around each portion of site work
6. Temporary walls around rooms with Owner access during construction to keep Staff and students from entering construction area

E. Special Requirements:

1. Refer to section 011000 for HCP requirements and impacts on temporary measures and additional requirements.
2. Refer to Section 011000 for the following items that relate to the project:

   a. Construction Activity Management Plans (SJVAPCD)
   b. Dust Control Plan (SJVAPCD)
   c. Storm Water Management Plan (State Water Resource Board)
   d. Indirect Source Review Plan (SJVAPCD)

1.3 SUBMITTALS

A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

B. Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 15 days of the date established for commencement of the Work.

C. Temporary Facility Site Plan: Submit a scaled Site Plan indicating all locations of temporary offices, storage units, fences - both long and short-term - by phase.

1.4 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:

1. California Building Code requirements – Chapter 33.
2. Health and safety regulations.
3. Utility company regulations.
4. Police, Fire Department and Rescue Squad rules.
5. Environmental protection regulations.
6. California State Accessibility standards, Title 24.
7. California Fire Code Chapters 5 & 14.

B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."

1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.
2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with California Electric Code (CEC).

C. The Contractor shall maintain, at the site, one (1) copy of the California Building Code, Title 19 and Title 24 (parts 1-5 & 9) of the California Code of Regulations.

1.5 PROJECT CONDITIONS

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of the permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

C. Site Access: Shall be coordinated with the Director of Maintenance and Operations. All areas damaged by construction work shall be remedied to his satisfaction. Access by persons with disabilities shall be maintained during construction. Architect shall approve all temporary persons with disabilities access to project area prior to implementing any work.

D. Advertising Matter: No advertising matter of any kind will be allowed on any part of the work in the field unless approved by the Architect and the Owner. Contractor shall provide 36" x 48" bulletin board for required posted materials viewable by all workers.

E. Drawings and Specifications at the Site: The Contractor shall maintain at the site for the Owner one copy of all Drawings, Specifications, Addenda, Approved Shop Drawings, Change Orders and other modifications, in good order and marked to record all changes made during construction. These shall be available to the Architect. The Drawings, corrected to record all changes during construction, shall be delivered to him for the Owner upon completion of the Work. See also Project Closeout, Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

B. Lumber and Plywood: Comply with requirements in Division-6 Section "Rough Carpentry."

1. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.
2. For fences and vision barriers, provide exterior type, minimum 3/8" thick plywood.
3. For safety barriers, sidewalk bridges and similar uses, provide minimum 5/8" thick exterior plywood.

C. Paint: Comply with requirements of Division-9 Section "Painting."

1. For sign panels and applying graphics, provide exterior grade alkyd gloss enamel over exterior primer.

D. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.

E. Water: Provide potable water approved by local health authorities.

F. Open-Mesh Metal Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized wire top strand and galvanized steel pipe posts, 1-1/2" I.D. for line posts and 2-1/2" I.D. for corner posts.

G. Open-Mesh Plastic Fencing: Plastic 2-inch fabric fencing, 6 feet high with galvanized steel pipe post, 1-1/2" O.D. for line and corner post.

2.2 EQUIPMENT

A. General: Provide new equipment; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

B. Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.

C. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.

D. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.

F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.

G. Temporary Offices: The General Contractor shall provide and maintain during progress of the work a field office building for the Inspector. Each office shall be equipped with one window and one door. The Inspector’s office shall have a separate entrance to exterior. Inspector’s office shall be separated from Contractor’s office by full-height partition wall – STC 45.

1. Each office shall be provided with six (6) electric outlets, data outlets, complete with wiring, fluorescent lights 3 watts/sf, and HVAC all of which shall be connected to service. Project Inspector and Architect shall have use of water, computer/internet, telephone, copier, and fax at no charge for items related to this project. Contractor shall provide a minimum 10’x10’ field office for this project for inspector and 10’ x 20’ minimum field office for Contractor staff and project meetings.
2. Furnish and equip offices as follows:

	General Contractor	Inspector
Telephone	2 (1 w/hands-free function)	1
Plan Table 96 x 36	2	1
4 Drawer Files	1	1
6 Shelf Bookcase	1	1
Desk	2	1
Meeting Table 96 x 36	1	
Chairs	8	3
Bottle Water/Cooler	1	
Copier – Plain Paper	1	
Fax Machine	1	
Telephone Answering Machine	1	1
Computer with internet access	1	
Printer	1	
Telephone lines	2	2

H. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material. Provide a ratio of one (1) toilet per ten (10) workers on job site, but not less than two (2) toilets.

I. First Aid Supplies: Comply with governing regulations.

J. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of CCR recommended classes for the exposures.

1. Comply with Title 19 CCR Division 1, Chapter 3 for classification, extinguishing agent and size required by location and class of fire exposure.

K. Temporary Storage Units: Provide 8’ x 8’ x 40’ storage units, weathertight with locking doors.

1. Provide 2 units locate as directed by the Campus Maintenance Director.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.

1. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
3. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Architect, and will not be accepted as a basis of claims for a Change Order.
4. The Contractor shall provide and pay for telephone services in the offices. The Architect, or his representative and inspector shall have unrestricted use of the phone for business purposes connected with this project.

B. Water Service: Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.

1. Sterilization: Sterilize temporary water piping prior to use.
2. Provide temporary water meter where Owner's water will be used.
3. Fire access per CFC 1410.1.
4. Fire water service to be active prior to arrival of combustible materials on site per CFC Sections 501.4 and 1412.1.

C. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switch gear.

1. Except where overhead service must be used, install electric power service underground.
2. Where existing electrical power is available, owner will pay for usage of electrical power on site for contractor’s use during period of construction. Contractor is responsible for all connection/disconnections and returning all items to original conditions.

D. Temporary Lighting: Whenever overhead floor or roof deck has been installed, provide temporary lighting with local switching.

1. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.

E. Temporary Telephones: Provide temporary telephone service for all personnel engaged in construction activities, throughout the construction period. Install telephone on a separate line for each temporary office and first aid station. Where an office has more than two occupants, install a telephone for each additional occupant or pair of occupants.

F. Computer Access: Provide computer with internet access and job site email account. Provide computer and printer. Provide data continuous access for inspector.

G. Web Cam: Provide continuous secure video of construction activities, recorded hourly at minimum.

3.3 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

A. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities as directed by Architect.

1. Maintain temporary construction and support facilities until completion.

B. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.

C. Heating Facilities: Except where use of the permanent system is authorized, provide vented self-contained LP gas heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited.

D. Field Offices for General Contractor & Inspector: Keep the office clean and orderly for use for project meetings. Field Office shall be cleaned weekly.

E. Storage Sheds: Install storage sheds, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service.

1. Provide (2) 8x40 roll off seatrain-type storage units, lockable and weather tight. Locate as directed by Owner. Both will remain property of Owner at close of project.

F. Toilets: Use of the Owner's existing toilet facilities will not be permitted.

G. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.

H. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.

I. De-watering Facilities and Drains: Maintain the site, excavations and construction free of water.

J. Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities.

1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.
3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.
4. Where temporary wood or plywood enclosure exceeds 100 square feet in area, use

UL-labeled fire-retardant treated material for framing and main sheathing.

5. Temporary enclosure where existing doors, glazing and frames are removed. Provide for Owner occupancy of these spaces where this work occurs.
6. Temporary roofing as required to preserve and protect work done and allow work to proceed without project being delayed.

K. Project Identification and Temporary Signs: Prepare project identification and other signs of the size indicated; install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs.

1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.
2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.

    a. Provide 48" x 48" sign indicating "Hard Hat Area", black/red on white.
    b. Provide 24" x 24" sign at each project entrance indicating "Authorized Personnel Only--No Trespassing", white text on red background with 1" white border.
    c. Provide temporary signs indicating disabled building access for each building during construction and allow for changes in access required by construction ways and means. Signs shall be 48" x 36", black/red text on white background with blue 1" border.
    d. Provide a 24"x24" sign at each project entrance indicating "No Cats, Dogs or Pets Allowed", red text on white background with 1" red border.

L. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

M. Refuse: Refuse barrels shall be provided for workmen's lunch boxes, papers and debris. All rubbish shall be removed from the premises.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations." Comply with CFC Chapter 14 – Fire Safety during all phases of construction and demolition.

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher per each 1000 square feet.
2. Store combustible materials in containers in fire-safe locations.
3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
4. Provide supervision of welding operations, combustion type temporary heating units, and

similar sources of fire ignition.

B. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights. The Contractor shall provide, install and maintain for the duration of the work, as required, all lawful or necessary barricades and railings, lights, warning signs and signals, and shall take all other precautions as may be required to safeguard persons, the site and adjoining property, including improvements thereon, against injuries and damages of every nature whatsoever. The Contractor shall not obstruct required exitways of adjacent structures.

C. Enclosure Fence: When excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs and other animals from easily entering the site, except by the entrance gates.

1. Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.

D. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.

1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

E. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment, which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

1. Dust Control: The Contractor shall exercise precautionary measures to minimize dust emissions which will include, but shall not be limited to, periodic sprinkling or wetting of the site, minimum of every day except as allowed by Architect. The Contractor has the option if using a dust palliative as specified in Caltrans 1981 Edition, Section 18.

    a. Fugitive dust shall be contained during earthwork activities by continuous sprinkling or wetting, as required, to bind soil to prevent fugitive dust. Roadways, walkways, construction areas and similar areas impacted by this project shall be maintained to prevent fugitive dust throughout the duration of project.
    b. All unpaved haul roads shall be watered a minimum of twice per day, not limited to project site.

2. Speed limit of vehicles on site shall not exceed 15 miles per hour and shall be under supervision of Contractor's Safety Representative, who shall evaluate field conditions and establish less speed as conditions change.
3. Storm Water Prevention: Provide a Storm Water Prevention Plan as required by the required governing agency. Provide a Storm Water Prevention Plan for all construction activities of this project. Submit to governing agency and comply with all agency

requirements. Comply and provide all mitigation measures in the governing agency approved Storm Water Prevention Plan. Coordinate plan with required HCP measures.

F. Enclosure fence of construction areas outside Contractor's staging area/main working compound, where construction activity is beyond enclosure of construction area and duration of work in that area is 30 days or less, provide open-mesh plastic fencing with post and barricades. Fencing shall be maintained equal to enclosure fence above with gated access.

3.5 OPERATION, TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
2. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Environmental Condition: This project will be occupied during construction. The Contractor shall provide fresh air to construction space total 1500 cfm for work space. Temporary duct modifications shall be made to prevent discharge of construction air into occupied spaces and maintain HVAC to occupied spaces. HVAC at construction area shall have a negative balance to prevent infiltration of construction air into any occupied areas. Construction area shall be aired out for 96 hours continually after all construction is complete and no material will be added that will cause vapors. After being aired out Contractor shall refit changes made to occupied spaces during construction and re-balance system to engineer's requirements.

D. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.
2. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:

    a. Replace air filters.
    b. Replace significantly worn parts and parts that have been subject to unusual operating conditions. (Unusual conditions shall be defined as 10% of equipment life.)
    c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use (substantial shall be defined as 10% of bulb life of accepted industry average hours).

END OF SECTION 015000

SECTION 016000 - MATERIALS AND EQUIPMENT

11/01/16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

B. The Contractor's Schedule of Submittals is included under Section "Submittals."

C. Standards: Refer to Section "Reference Standards and Definitions" for applicability of industry standards to products specified.

D. Related Sections:

1. Division 1 Section “Allowances” for products selected under an allowance.
2. Division 1 Section “Alternates” for products selected under an alternate.

1.3 DEFINITIONS

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms such are self-explanatory and have well recognized meanings in the construction industry.

1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

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

2. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

1.4 SUBMITTALS

A. Product List Schedule: Prepare a schedule showing products specified in a tabular form acceptable to the Architect. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.

1. Coordinate the product list schedule with the Contractor's Construction Schedule and the

Schedule of Submittals.

2. Initial Submittal: Within 35 days after date of commencement of the Work, submit 3 copies of an initial product list schedule. Provide a written explanation for omissions of data, and for variations from Contract requirements.

B. Architect's Action: The Architect will respond in writing to the Contractor within 21 days of receipt of the completed product list schedule. No response within this time period constitutes no objection to listed manufacturers or products, but does not constitute a waiver of the requirement that products comply with Contract Documents. The Architect's response will include the following:

1. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

C. Colors: Provide finish selections indicated in the Project Manual and Plans.

1. Acceptable Manufacturers: The products and manufacturer’s specified in the Project Manual and Plans are for purposes of establishing color and quality. Refer to each Specification Section for additional manufacturers and Project Manual Section “Submittals”.
2. Manufacturer’s Standard colors and Finishes: Where the Project Manual or Plans specifies a manufacturer’s standard color or finish, the Architect makes no guarantee that matching colors or finishes are available as other non-listed manufacturer’s “standard colors” from the listing of acceptable manufacturers. The Contractor shall be responsible for providing colors matching those indicated in the Project Manual of listed acceptable manufacturer in the Project Manual at no additional cost.
3. Custom Colors: Where the Finish Schedule Project Manual and or Plan indicates a specific manufacturer’s colors, other acceptable manufacturer shall provide matching custom colors where a standard color in not acceptable at no additional cost.
4. Substitutions: The Contractor will match the color and or finish available for the acceptable manufacturers listed in the Project Manual and/or Plans as a custom color and at no additional cost to the Owner.

1.5 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.

B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:

a. Name of product and manufacturer.

b. Model and serial number.
c. Capacity.
d. Speed.
e. Ratings.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.

1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
3. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
4. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
7. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.

1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.

B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

1. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
2. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.

a. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.

3. Visual Matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.
4. Visual Selection: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern and texture from the product line selected.
5. Basis-of- Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturer(s), provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions and other characteristics that are based on the product named.
6. Products/Manufacturers:

a. Restricted list: Where specifications include a list of names of both/either manufacturers and products, provide one of the products listed that comply with requirements. Comparable products or substitutions for Contractor’s convenience will not be considered, unless otherwise indicated.

7. Sole Sourcing: The Owner has made a finding that in order to meet the project requirements and properly match a particular existing installation, installation in the course of completion and/or of an item of intellectual nature on campus that a sole source specification will be required for those specific item(s). The Owner has on file a list of proprietary products, vendors, campus standards and services to be contracted as sole source items as prescribed in Public Contract Code sections. The Owner reserves the right to sole source these items as prescribed herein.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS:

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.

1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of final acceptance.

END OF SECTION 016000

SECTION 017300 - CUTTING AND PATCHING

07/01/15

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

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

B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1. Requirements of this Section apply to mechanical and electrical installations. Refer to Division-22, 23 and 26 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

C. Demolition of selected portions of the building for alterations is included in Division 2:
1. Division 2 Section "Selective Demolition" for building demolition and related work.

1.3 SUBMITTALS

A. Cutting and Patching: Submit a plan describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required and how it is to be performed; 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 and other significant visual elements.
3. List products to be used and firms or entities that will perform Work.
4. Indicate dates when cutting and patching is to be performed.
5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

1.4 QUALITY ASSURANCE

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

1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements. Any changes from Contract Documents of cutting and patching shall be approved by DSA.

a. Foundation construction.
b. Bearing and retaining walls.
c. Structural steel.

d. Timber and primary wood framing.
e. Structural decking.
f. Miscellaneous structural metals.
g. Exterior curtain wall construction.
h. Equipment supports.
i. Piping, ductwork, vessels and equipment.

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

1. Obtain approval of cutting and patching before cutting and patching the following operating elements or safety related systems:

a. Shoring, bracing, and sheeting.
b. Primary operational systems and equipment.
c. Water, moisture, or vapor barriers.
d. Membranes and flashings.
e. Fire protection systems.
f. Control systems.
g. Communication systems.
h. Electrical wiring systems.
i. Security systems.

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 INSPECTION

A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

1. Before proceeding, meet at the site with parties 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.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.
B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project 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. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 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.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction.

1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required 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 diamond core drill.
4. Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.
5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
6. Cut limit to be determined by access requirements, backing location, support spacing and standard modules of finish material. Intent is to restore finish to unbroken appearance.
7. Bolts shall be cut to within 3/4" of nuts maximum at all threaded rods, hangers and similar applications. Architect shall confirm any exceptions to this requirement. Dress end of cut threads for removal/reinstallation. If bolts are galvanized, spray raw metal with galvalume touch up paint.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances, if none noted per standard of care of the industry.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.

    a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken item containing the patch, after the patched area has received primer and second coat.

3.4 CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering and other items to its original condition.

END OF SECTION 017300

SECTION 017700 - PROJECT CLOSEOUT 10/26/15

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 &1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

1. Project Completion and Acceptance
2. Inspection procedures.
3. Project record document submittal(s).
4. Operating and maintenance manual submittal(s).
5. Submittal of warranties.
6. Statement of extra materials delivered to Owner, accepted and signed by Owner
7. Training attendees form
8. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 0 through 33.

C. See Division 1 Section "Governing Agency" for DSA Final Verified Reports to be filed.

1.3 PROJECT COMPLETION

A. Contractor shall notify the Architect in writing when the project is acceptably completed; all work scope is done and ready for Project Inspector and Contractor to make a list of items to be corrected.

B. The Project Inspector and Contractor shall make a list of items to be corrected and finish any items discovered incomplete. These items shall be completed and corrected prior to Architect and Consultants preparing a Final Inspection and Punch List Preparation. Contractor shall notify Architect in writing when all items are completed and corrected as well as items completed and corrected from Project Inspector and Contractor list of items previously prepared.

C. Architect's field representatives (Architectural, Mechanical, Electrical, and other consultants) will make a field survey of the project to confirm that it has reached a state of completion, and items for "B" above have been done, in order to eliminate an unreasonably long Punch List on final inspection.

1. All items in scope of work have been completed and accepted by Contractor and Project Inspector.
2. All building systems are operational, tested and commissioned.
3. Cleaning of building, grounds and related items completed except when approved by architect in writing in advance of field survey. Contractor’s temporary measures may be left in place until final demobilization but a condition on removal for final

payment processing.

4. Contractor to provide a written status update of project closeout check list.

D. If not ready, the Architect will give the Contractor a written brief summary of what must be done for the project to be considered complete, enough for the Punch List preparation.

E. When, in the opinion of the Architect, the job is ready for the Punch List preparation, a Punch List of items requiring completion and/or correction will be prepared. (This Punch List will be made as specific and complete as possible, and will include the listing of all specified closing items required of the Contractor, such as Record Drawings, maintenance manuals, written guarantees, etc.) Any items observed or noted subsequent to Punch List preparation, shall also be corrected prior to re-inspection, unless the Architect determined, in writing, that any such items properly fall into the category of work to be corrected during the warranty/guarantee period.

1. Architect's Punch List preparation will be scheduled and respective contractors, sub-contractors and vendors shall be present during the Punch List inspection. Sub-Contractors, contractors and vendors will be required to show operational status of items in project scope of each respective discipline.
2. Mechanical, Electrical, and other consultants Punch List preparation will be scheduled and respective sub-contractor, contractors and vendors shall be present during the Punch List inspection. Sub-Contractors, contractors and vendors will be required to show operational status of items in project scope of each respective discipline.
3. All Punch List items shall be completed and/or corrected before Contractor calls for Punch List re-inspection.

    a. Architect shall be notified in writing by Contractor when all Punch List items are complete and project is ready for punch list back check by architect and consultants. Architect shall schedule punch list back check with contractor within 10 calendar days from receipt of written notice from Contractor.
    b. Architect will allow contractor two, (2), punch list back check visits of all items. Any additional site visits for items not completed and acceptable to Architect after second site visit will charged to the contractor as a negative change order for time spent by Architect to do re-inspections and office related work including reimbursable expenses incurred due to additional site visits.

1.4 PROJECT ACCEPTANCE AND NOTICE OF COMPLETION

A Notice of Completion will not be prepared nor moved forward for Owner approval until all of the following are complete:

1. Project Closeout 100% complete.
2. Punch list items 100% complete.
3. Record documents approved and delivered.
4. All warranties and guarantees have been delivered and accepted by Owner and Architect.
5. Training complete.
6. The contractor(s) final verified report is filed with the Division of State Architect of the Department of General Services.
7. OWNER is able to occupy all portions of the project as intended on Construction Documents.
8. Contractor in direct contract with the owner upon completion of work shall execute certifications as follows:

a. Asbestos Certification shall be used for documentation of non-asbestos materials used in project.
b. PCB Certification shall be used for documentation of non-PCB materials used in project.
c. Lead Certification shall be used for documentation of non-lead materials used in project.
d. In-Service Certification Forms shall be used for all documentation of in-service activities. Copies of forms shall be included in maintenance and operation manuals.
e. Prevailing Wage Certification shall be used for conformation/certification that prevailing wage were paid for this project.
f. Affidavit of Payment of Debts and Claims and Release of Stop Notices shall be notarized and submitted as part of the project closeout requirement.
g. Extra Materials Receipt shall be signed by College M&O Director.
h. Training Attendees Form shall be completed by College staff attendees and acknowledged by the Project Inspector.

B. Notice of Completion shall be prepared and approved by Owner prior to recording. The official project acceptance date shall be the date of Owner acceptance of the project and authorization to filing of the Notice of Completion. Owner shall record Notice of Completion within 10 days of acceptance of project as being complete. All warranties start dates will be Date of recordation of Notice of Completion.

C. The project shall be accepted by the Owner who shall authorize after acceptance of the project the subsequent filing of the Notice of Completion. The final payment shall be made thirty-five (35) days from the date of recordation of the Notice of Completion, provided that: The Contractor shall furnish satisfactory evidence that all claims for labor and materials have been paid and that no claims shall have been presented to the Owner by any person or persons based upon any act or omission of the Contractor, and no Stop Notices or claims shall have been filed against said work or the property whereon it was done.

1. The Contractor in direct contract with the Owner must record and file with the Owner an Affidavit of Payment of Debts and Claims and Release of Stop Notices prior to request for project acceptance is considered by the Board of Trustees. By this document, the contractor hereby certifies that on date of document recordation, he/she has been paid in full less retainage for all materials and equipment furnished, for all labor and services performed, and for all known indebtedness and claims against the undersigned for damages arising in any manner on or against the Project, its land, improvements, and equipment of any kind.
2. All others not limited to sub-contractors, lower tier contractors, suppliers, vendors and others providing services, materials, equipment and related items must record their liens and serve owner stop notice within thirty (30) days of the date the Notice of Completion is recorded to place and person indicated in project manual herein. (Civil Code §3116).

1.5 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used,

record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with erasable pencil.
2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
3. Note related Change Order numbers where applicable.
4. Submit one copy of record drawing for Architect's review.

    a. Show all underground utility locations and routings by horizontal and vertical dimensions.
    b. Show all overhead utility locations and routings by horizontal and vertical dimensions.
    c. Clearly indicate at each affected detail and other Drawings a full description of changes made during construction. Call attention to each entry by drawing a "cloud" around the area(s) affected.

5. Once reviewed and approved by the Architect, organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set. Provide Owner with two (2) copies black and white, original (1), original red-lined with changes and two flash drives of scanned black and white copies.

C. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

1. Upon completion of mark-up, submit one complete set of record Product Data to the Architect for the Owner's records.

D. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Architect and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.

E. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect for the Owner's records.

1.6 PROJECT CLOSEOUT BINDER(S) SUBMITTAL

A. Submit requirements per project manual section(s) one copy in a binder(s) and two (2) copies of scanned data in binders on flash drives. See Project Closeout form at the end of this section for additional requirements. Note that this form shall be updated with additional materials and sections once Contractor starts submitting closeout documents to include issued addenda, RFPs, FCDs and other items added in the bid document

during construction. All required number of years for warranty shall be provided by the Contractor. In the event this conflicts with manufacturer's warrant, more restrictive will prevail. If manufacturer will not meet requirements, Contractor shall take full responsibility for additional warranty requirement above what manufacturer will provide.

1. Binder(s)

    a. Part 1 - Technical Sections

        1) Organize sections items per CSI Format descending order.

    b. Part 2 - General Requirement items

        1) Tab in order per project list herein at end of this section.

2. Binder(s) shall have cover sheet inserted in front face and side label. Cover sheet shall have the following information:

    a. Project name
    b. College name
    c. Date of Notice of Completion
    d. Labeled "Part 1", in the event of multiple binders for a Part, add volume number and list sub-binders on title sheet with name of each specific binder.
    e. General Contractor's name.
    f. Index of items in binder.

3. Labeled divider tabs shall be provided for each section as listed on index on cover.
4. Each applicable section will have the following documents in order:

    a. Subcontractor's Warranty
    b. Product data
    c. Manufacturer's warranty

        1) Each installed equipment, especially for Divisions 21, 22, 23 and 26, shall have warranties from manufacturers with project name stated in the certificate. All forms submitted to the manufacturers to secure warranty shall be enclosed as part of project closeout.

    d. Proposal for continuing services and/or post construction inspection dates – if applicable
    e. Tests/ reports/ certifications/ agreement between Contractor/ Manufacturer/ Subcontractor to repair and replace
    f. Shop drawings
    g. Cleaning data
    h. Receipt of extra material acceptance by the M & O director – see form at the end of section
    i. Training attendees' form – see form at the end of section
    j. Other document required:

        1) Maintenance data
        2) Emergency Instructions
        3) Spare parts lists
        4) Wiring diagram
        5) Inspection procedure

6) Recommended “turn around cycles”
7) Lubricants, special tools
8) Control sequences
9) Hazards
10) Fixture lamping schedule
11) Proof of training for equipment operation with list of attendees from College staff

C. Submit general requirements in another binder.

1. Binder shall have a cover sheet and side label. Cover shall have the following information:

a. Project name
b. College name
c. Date of Notice of Completion
d. Labeled “Part 2”
e. General Contractor’s name

2. Binder shall have table of contents. This binder will contain the following:

a. Demobilization information with General Contractor’s Letterhead and signed by Project Manager.

1) Indicate dated for the following information:

a) Removal of temporary office
b) Removal of temporary fence barricades
c) Disconnect/safing temporary utilities
d) Repair temporary staging to pre-construction or specified condition
e) Removal of temporary toilets
f) Removal of miscellaneous construction debris/ excess materials
g) Removal of project sign, deliver to Owner if requested
h) Removal of miscellaneous project signs
i) Removal of trash dumpster

b. Instructions for Operating equipment signed off by College Staff (see Project Closeout form) with General Contractor’s Letterhead and signed by Project Manager.
c. Certification of no asbestos used or substituted
d. Certification of no lead containing products used or substituted
e. Certification of no PCB containing products used or substituted
f. Certification of substitutions made on project, if none state so
g. All substitution products shall be listed and shall indicate substitution number and date approved by the Architect.
h. Notarized affidavit of payment of debts and claims and release of stop notices
i. Prevailing wage reports/ documents
j. Verified DSA report
k. Consent of surety to final payment
l. Statement of final liquidated damages settlement
m. Final utility meter readings signed by Project Inspector

1.7 PROJECT CLOSEOUT NOTIFICATION, SURETY NOTIFICATION

A. If requested in writing, the contractor will be given a project Close-out check list of items to be completed prior to project being accepted as complete. Contractor shall start project closeout no later than 90% completion of project and be complete prior to project punch list preparation/walk. This is contractor's first notice. Notice of Completion will not be filled until project closeout is complete.

B. The contractor will be given a 20 calendar day notification that the project closeout is incomplete and notification that owner will complete project closeout work incomplete and assess contractor additional architectural and engineering fees incurred completing work not complete and per construction documents. Copy will be sent to surety.

C. The contractor will be given a final 10-day notice to complete all project closeout items. The estimated amount of costs will be indicated therein that the owner will be spending for completing the project closeout. Items done by the owner and additional architect's fees will be deducted from funds due contractor. Copy will be sent to surety.

D. If project closeout is not complete after deadline in Item "C" above, the notice of completion will be filed listing incomplete items. Owner will complete project closeout and deduct cost incurred from funds held. Balance of funds will be distributed per Contract Documents. Surety will be notified of actions taken.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Lubricants.
6. Fuels.
7. Identification systems.
8. Control sequences.
9. Hazards.
10. Cleaning.
11. Warranties and bonds.
12. Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following procedures:

1. Start-up.
2. Shutdown.

3. Emergency operations.
4. Noise and vibration adjustments.
5. Safety procedures.
6. Economy and efficiency adjustments.
7. Effective energy utilization.

3.2 FINAL CLEANING

A. General: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for Certification of Notice of Completion.

a. Remove labels that are not permanent labels.
b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
e. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

3.3 FORMS

A. In-Service Certification Forms shall be used for all documentation of in-service activities. Copies of forms shall be included in maintenance and operation manuals.

B. Asbestos Certification shall be used for documentation of non-asbestos materials used in project.

C. PCB Certification shall be used for documentation of non-PCB materials used in project.

D. Lead Certification shall be used for documentation of non-lead materials used in project.

E. Prevailing Wage Certification shall be used for conformation/certification that prevailing wage were paid for this project.

F. Affidavit of Payment of Debts and Claims and Release of Stop Notices shall be notarized and submitted as part of the project closeout requirement.

G. Project Closeout Liquidated Damages Contract Sum-Days Calculation shall be used for liquidated damages computation.

H. Extra Materials Receipt shall be used for documentation of extra materials required by construction document; to be submitted to College M&O Director.

I. Training Attendees Form shall be used for documentation of College staff that participated in the training scheduled and coordinated by the Contractor.

IN-SERVICE CERTIFICATION

Specification Section No._____

Project: _____ Date: _____

Owner: _____

Architect: _____ File No: _____

Contractor: _____ Project No: _____

Inspector: _____ DSA Application No: _____

In-Service Conducted By:_____

Materials Reviewed: (Check Applicable Boxes)

- ☐ Record Drawings
- ☐ Warranties
- ☐ Maintenance Agreement
- ☐ Operation & Maintenace Manuals
- ☐ Special Tools and Parts
- ☐ Safety Procedures
- ☐ Cleaning Procedures
- ☐ Identification Systems
- ☐ Start-Up
- ☐ Control Sequences
- ☐ Shut Down
- ☐ Controls Manipulation
- ☐ Emergency Procedures
- ☐ Noise/Vibration Adjustment
- ☐ Effective Energy Utilization

Attendees (Please print name and sign below)

1. District Facilties Representative _____
2. Site Representative _____
3. District Maintenance Representatives _____ (Plumbing) _____ (Mechanical) _____ (Electrical) _____ (Grounds)
4. Others Present (P.I. General Contractor) _____ _____

Meeting Date_____ Time of Start_____ Time of Completion_____

I certify that the above named in-service covered all aspects of the specialty for which it was convened.

Signature _____ Date _____

ASBESTOS CERTIFICATION

Specification Section No._____

Project: _____ Date: _____

_____

Owner: _____

Architect: _____ File No: _____

Contractor: _____ Project No: _____

Inspector: _____ DSA Application No: _____

To: _____

From: _____

Subject: **Asbestos Containing Building Materials Letter**

I hereby certify that, to the best of my knowledge, the materials furnished and/or installed

by _____ or its
(Name of Contractor)

subcontractor for _____ located at
(Name of Project)

_____ do not contain Asbestos-
(Project Address)

Containing Building Materials.

Signed: _____

Position: _____

Dated: _____

PCB CERTIFICATION

Specification Section No._____

Project: _____ Date: _____

_____

Owner: _____

Architect: _____ File No: _____

Contractor: _____ Project No: _____

Inspector: _____ DSA Application No: _____

To: _____

From: _____

Subject: **PCB-Containing Building Materials Letter**

I hereby certify that, to the best of my knowledge, the materials furnished and/or installed

by _____ or its
(Name of Contractor)

subcontractor for _____ located at
(Name of Project)

_____ do not contain PCB-
(Project Address)

Containing Building Materials.

Signed: _____

Position: _____

Dated: _____

LEAD CERTIFICATION

Specification Section No._____

Project: _____ Date: _____

_____

Owner: _____

Architect: _____ File No: _____

Contractor: _____ Project No: _____

Inspector: _____ DSA Application No: _____

To: _____

From: _____

Subject **Lead Containing Building Materials Letter**

I hereby certify that, to the best of my knowledge, the materials furnished and/or installed by _____ or its
(Name of Contractor)

subcontractor for _____ located at
(Name of Project)

_____ do not contain Lead-
(Project Address)

Containing Building Materials.

Signed: _____

Position: _____

Dated: _____

PREVAILING WAGE CERTIFICATION

Project: _____ Date: _____

Owner: _____

Architect: _____ File No: _____

Contractor: _____ Project No: _____

Inspector: _____ DSA Application No: _____

To: _____

From: _____

Subject **Prevailing Wage Certification Letter**

I hereby certify that, all payments made to employees of Contractor and subcontractors are based on prevailing wage per Article 2 Chapter 1, Part 7, Division 2 of the California Labor Code and all contractors and subcontractors did furnished electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement). Prevailing wage records for each pay request processed are on file and available upon request. Contact _____
(Name of Contact Person)

with _____ to request copies. Contact number is
(Contractor's Name)

_____ and office address is located at _____
(Office number)

_____.
(Contractor's Address)

Signed: _____

Position: _____

Dated: _____

AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS AND RELEASE OF STOP NOTICES

Project: _____ Date: _____

_____

Owner: _____

Architect: _____ File No: _____

Contractor: _____ Project No: _____

Inspector: _____ DSA Application No: _____

By this instrument, the undersigned hereby certifies that on this date, he/she has been paid in full less retainage for all materials and equipment furnished, for all labor and services performed, and for all known indebtedness and claims against the undersigned for damages arising in any manner on or against the PROJECT, its land, improvements, and equipment of any kind. Therefore, the undersigned does hereby waive and/or release any and all claims and/or stop notices against the PROJECT as of the _____ day of _____, in the year of 20____.

COMPANY: _____

BY: _____

TITLE: _____

STATE OF _____

COUNTY OF _____

Before me the undersigned authority on this date personally appeared _____, Known to me to the person whose name is subscribed to the foregoing instrument, and being first duly sworn, acknowledged to me that he executed the same for the purposes and consideration therein expressed and declared to me that the statements contained therein are true.

Sworn and subscribed to before me this ____ day of _____ year of 20____.

_____

Notary Public in and for said
State and County

My commission expires: _____

PROJECT CLOSEOUT LIQUIDATED DAMAGES CONTRACT SUM-DAYS CALCULATION

Project: _____ Date: _____

Owner: _____

Architect: _____ File No: _____

Contractor: _____ Project No: _____

Inspector: _____ DSA Application No: _____

Contract Days Actual				
	Original Contract Duration (Calendar Days)			
	Approved Change Orders (Calendar Days)			
			Adjusted Contract Days	
Liquidated Damages				
	Project Start Date			
	Project Completion Date		Actual Construction Days	
	Liquidated Damages/Day		Difference Actual - Actual	
			Liquidated Damages (Dollars)	
Contract Sum				
	Original Contract Sum (Dollars)			
	Approved Change Orders (Dollars)			
			Adjusted Contract Sum	
			Paid to Date	
			Retention withheld to date	
			Total Paid to date including Retention	
Adjusted Contract Sum				
			Balance Contract Sum less Total Paid to Date/Retention	
			Liquidated Damages	
			Testing/Inspections Back-Charges	
			Unused Allowances	
			Special Holdouts	
			Balance	
Stop Notices				
			Stop Notice amount x $150%	
			Total	

EXTRA MATERIALS RECEIPT

Specification Section No._____

Project: _____ Date: _____

Owner: _____

Architect: _____ File No: _____

Contractor: _____ Project No: _____

Inspector: _____ DSA Application No: _____

List of Materials to surrender to M&O office/Director:

Item #	Qty.	Description

I certify that the above extra materials are all in good condition and meet the required quantity per construction documents.

Submitted by:

Signature _____ Date _____

Received by:

Signature _____ Date _____

TRAINING ATTENDEES FORM

Specification Section No._____

Project: _____ Date: _____

_____

Owner: _____

Architect: _____ File No: _____

Contractor: _____ Project No: _____

Inspector: _____ DSA Application No: _____

Subject: _____

Location: _____

Description of Training: _____

_____

_____

List of Attendees:

Name	Department	Signature

Submitted by:

Signature _____ Date _____

Contractor

Acknowledged by:

Signature _____ Date _____

Project Inspector

PROJECT CLOSEOUT CHECKLIST

pub.rev.04/05/04

PROJECT: _____ **DATE INITIAL REQUEST:** _____

PROJECT NO: _____ **DATE DUE BACK:** _____

CONTRACTOR: _____

STATUS: _____

- **X Initial request for documents**
- **. Incomplete see below**
- **. Accepted as complete**
- **Date completed:**

LEGENDS:

- **C** - Contractor
- **S** - Subcontractor
- **O** - Owner
- **A** - Architect
- **E** - Engineer
- **PI** - Project Inspector
- **M** - Manufacturer

PROJECT CLOSEOUT

PART 1- General Closeout Items

Provide information as required in the Project Manual. See checklist below for items required. Tabulate each section and provide information required.

1. Project identification sheets
    a. Project name, location, date of start/completion of construction
    b. Copy of Completed Project Closeout Checklist
    c. Copy of Notice of Completion
2. Project contacts, names, address, phone numbers, fax number, email and web sites.
    a. General contractor
    b. Sub-contractors/lower tier sub-contractors
        1) List by CSI format
    c. Suppliers direct to Contractor
3. Project Warranties
    a. List by CSI format
4. Maintenance Agreements
    a. List by CSI format
5. Record Drawings flash drive
    a. Plastic sleeve with record drawings scanned to flash drive.
6. Forms
    a. In-Service Certification Forms shall be used for all documentation of in-service activities. Copies of forms shall be included in maintenance and operation manuals.
    b. Asbestos Certification shall be used for documentation of non-asbestos materials used in project.
    c. PCB Certification shall be used for documentation of non-PCB materials used in project.
    d. Lead Certification shall be used for documentation of non-lead materials used in project.
    e. Affidavit of Payment of Debts and Claims and Release of Stop Notices shall be notarized and submitted as part of the project closeout requirement.
    f. Affidavit of Substitutions shall be notarized and submitted as part of the project closeout requirement.
    g. Extra Materials Receipt shall be used for documentation of extra materials required by construction. document; to be submitted to M&O Director.
        1) Provide form for each material by Technical Section
    h. Training Attendees Form shall be used for documentation of College staff that participated in the training scheduled and coordinated by the Contractor.
        1) Provide form for each material by Technical Section.

PART 2 - Technical Section Close out items

Provide information as required in technical section of the Project Manual. See checklist below for items required. Tabulate each section and provide information required. Warranty information will be provided in Binder one under tab 3 and also in each technical section. Information requested herein shall be the minimum requirements.

SECTION	SECTION NAME	BY	DATE COMPLETED
002113	INSTRUCTION TO BIDDERS		
	Copy of Dust Control Plan Sections 1-6 (submitted to Region Office)	**C**	
	Copy of submitted San Joaquin Valley Air Pollution form	**C**	
014000	QUALITY CONTROL SERVICES		
	Weigh Master Certificate	**S**	
018000	CONSTRUCTION WASTE REDUCTION/ DISPOSAL & RECYCLING		
	Construction Waste Management Plan	**C**	
	Construction Waste Management Worksheet(s)	**C**	
	Construction Waste Management Acknowledgement	**C**	
	Final diversion report with receipts	**C**	
033000	CAST-IN –PLACE CONCRETE		
	Warranty – 15 years for concrete sealer/hardener/curing compound	**M**	
062000	FINISH CARPENTRY		
	Cleaning and maintenance data	**S**	
064000	INTERIOR ARCHITECTURAL WOODWORK		
	WI Certificate of Compliance for installation	**S**	
	Cleaning and maintenance		
064100	SOLID POLYMER FABRICATION		
	Cleaning and maintenance	**S**	
	Warranty – 10 years	**M**	
071100	SHEET MEMBRANE WATERPROOFING		
	5-year written warranty	**S**	
075720	POLYURETHANE FOAM ROOFING		
	Manufacturer's standard guarantee-10 years NDL	**M**	
	Maintenance data	**S**	
	Post construction inspection dates	**M**	
076000	FLASHING AND SHEET METAL		
	Warranty 10 year-self-adhering waterproof membrane	**M/S**	
079200	JOINT SEALANTS		
	Warranty by installer - 5 years	**S**	
	Warranty manufacturer's-5 years	**M**	

081416	FLUSH WOOD DOORS		
	Warranty manufacturer lifetime from Contractor/Installer/Mfg.	**S/C/M**	
	Lifetime warranty from Door Manufacturer	**M**	
	WIC Monitored Compliance Certificate	**M/S**	
085113	ALUMINUM WINDOWS		
	Special warranty (085113 1.8.B)	**M**	
	Warranty (5 year) metal finishes and glass	**M**	
087100	DOOR HARDWARE		
	Supplier written verification that all hardware is functioning properly and installed per manufacturer	**S**	
	Final hardware list (USB Drive or CD)	**S**	
	Warranties:		
	Closers - 10 years	**S**	
	Exit devices - 5 years	**S**	
	Hinges - life of building	**S**	
	All other hardware - 2 years	**S**	
	Tools & instructions of each device/hardware item	**S**	
	Evidence for six month adjustment	**S**	
	Key transcript:		
	Owner instruction in adjustment/maintenance	**S**	
	Tentative date for 6-month 24-month adjustment of hardware/report	**S**	
088000	GLASS AND GLAZING		
	Insulated glass warranty 5 year	**M**	
	Laminated glass warranty – 5 year	**M**	
093013	CERAMIC TILE		
	Extra material 3% each type/color	**S**	
	Cleaning and maintenance data	**S**	
	Grout sealer 2-year warranty	**S**	
095113	ACOUSTICAL PANEL CEILINGS		
	Extra material 2% (three case minimum each type of ceiling)	**S**	
095123	ACOUSTIC TILE CEILING		
	Extra material 2% (see form)	**S**	
096513	RESILIENT WALL BASE AND ACCESSORIES		
	Extra material - see section item 1.7.A (see form)	**S**	
	Cleaning and maintenance data	**S**	
096516	SHEET VINYL FLOOR COVERINGS		
	Extra materials – see section item 1.7.A (see form)	**S**	
096813	CARPET TILE		
	Extra materials 5% full width of each color/type (see form)	**S**	

	Rubber backing warranty	**M**	
	Lifetime wear	**M**	
	Lifetime edge panel	**M**	
	10-year Colorfastness to Light Warranty	**M**	
	5-year Warranty to Colorfastness to Atmospheric Contaminants	**M**	
	Lifetime static	**M**	
	Lifetime delamination and zippering	**M**	
	Cleaning and maintenance data	**M**	
097723	VINYL COVERED TACK BOARD		
	Extra materials 2% - minimum 2 full size sheets each color (see form)	**S**	
	Cleaning and maintenance data	**S**	
099000	PAINTING		
	Extra materials unopened containers - accepted and signed by M&O	**S**	
100000	MISCELLANEOUS ITEMS		
	Cleaning and maintenance data	**S**	
101423	SIGNS		
	Cleaning and maintenance data	**S**	
	Warranty - 5 years	**S**	
102113	TOILET COMPARTMENTS		
	Cleaning and maintenance data	**S**	
	Warranty – 15 years	**M**	
102800	TOILET AND BATH ACCESSORIES		
	Cleaning and maintenance data	**S**	
	Mirror warranty 15 years	**M**	
	Bobrick accessories – 3 years warranty	**M**	
	Hand dryer- 10 year warranty	**M**	
220000	PLUMBING		
	Operating instructions & maintenance procedure	**S**	
	Summary list of plumbing fixtures/ equipment	**S**	
	Servicing instructions	**S**	
	6-year warranty certificate of water heater with serial number	**M**	
	5-year warranty certificate of expansion tank with serial number	**M**	
	3-year warranty of circulation pump with serial number	**M**	
230000	HVAC		
	Operating instructions & maintenance procedure	**S**	
	Servicing instructions	**S**	
	10-year warranty certificate of boiler with serial number	**S**	
	Air Handlers' warranty with serial number	**S**	
	Test & Balance report approved by Mechanical Engineer	**S**	
	Complete wiring and control diagrams for all equipment	**S**	

	Hydronic piping tests approved by the Project Inspector	**S**	
260000	ELECTRICAL		
	Operating instructions & maintenance procedure	**S**	
	Field Test Reports approved by Electrical Engineer	**S**	
	Servicing instructions	**S**	
165210	FIRE ALARM SYSTEM		
	Fire alarm system record of completion	**S**	

PART 3 - Specific Close out items

RECORD DRAWINGS –Full size drawings.

Provide original red lined record drawings, full size and one (1) black and white copy, full size. Provide two copies, (2) on flash drive of digitally color scanned record drawings.

CONTRACTOR DSA CLOSE OUT REQUIREMENTS:

Weigh master certificates for Concrete	**C**	
Verified DSA Reports	**C**	

PREVAILING WAGE CERTIFICATION:

Prevailing Wage Certification: Statement shall be used for conformation/certification that prevailing wage were paid for this project.	**C**	

PART 4 – Final Payment

FINAL PAYMENT:

The following items shall be completed and accepted prior to acceptance of final pay request and consideration for payment by owner. All the above items shall be complete and accepted by Architect and Owner

Affidavit of Payment of Debts and Claims and Release of Stop Notices	**C**	
Consent of Surety to Final Payment	**C**	
Final Liquidated Damages settlement statement	**C**	
Final Pay Request	**C**	`
File Notice of Completion	**O**	

END OF SECTION 017700

SECTION 017800 - WARRANTIES AND BONDS 10/26/15

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 0 & 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

1. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.
2. General closeout requirements are included in Section "Project Closeout."
3. Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual Sections of Divisions 2 through 33.
4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
5. Items that are omitted and/or different than specified/indicated herein and on Construction Documents and items not indicated as a change on Submittals, shall be warrantied as required in Sections 006002 and 013300.

B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

C. Notwithstanding any tests, approvals, certificates, commissioning, inspection or otherwise by the Owner, Architect or any other consultant employed by or on behalf of the employer, the Contractor shall be and remain fully and exclusively responsible and liable for ensuring that his works, and all goods and materials therein are in every respect and detail in accordance with the Contract Documents, and no such tests, approval certificates, commissioning, inspection or otherwise shall in any way diminish or negate the Contractor's responsibility or liability as foresaid.

1.3 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall

not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

E. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.4 SUBMITTALS

A. Submit written warranties to the Architect prior to the date certified for Notice of Completion. If the Architect's Certificate of Notice of Completion designates a commencement date for warranties other than the date of Notice of Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.

1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within fifteen days of completion of that designated portion of the Work.

B. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Architect for approval prior to final execution.

1. Refer to individual Sections of Divisions 2 through 33 for specific content requirements, and particular requirements for submittal of special warranties.

C. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.
2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS, the Project title or name, and the name of the Contractor.
3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (Not Applicable).

PART 3 – EXECUTION

3.1 FORMS

A. Project Warranty Form, see attached.

B. Subcontractor Warranty Form, see attached.

END OF SECTION 017800

PROJECT WARRANTY

Project: BCSD – Campus Infrastructure Upgrades
Mt Vernon Elementary School
Owner: Bakersfield City School District
Architect: AP Architects
Contractor:
Inspector:

Date:
File No:
Project No: 566-0020
DSA Appl No:

_____(Contractor) hereby warrants to the Owner that materials and equipment furnished under the Contract in the _____ (Name of Project) are of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work is free from defects not inherent in the quality required or permitted, and that the Work conforms with the requirements of the Contract Documents. Work not conforming to these requirements, including substitution not properly approved and authorized, may be considered defective. This warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage.

If, within ___ year(s) after the date of Notice of Completion of the Work or designated portion thereof, or by terms of an applicable special warranty required by the Contract Documents extending this time period, and of the Work is found to be not in accordance with the requirements of the Contract Documents or proves to be defective in materials or workmanship, the Contractor expressly agrees to correct it, without expense to the Owner, promptly after receipt of written notice from the Owner or his agent to do so unless the Owner has previously given the Contractor written acceptance of the condition. This period of ____ year(s) shall be extended with respect to portions of the Work first performed after Notice of Completion by the period of time between Notice of Completion and the actual performance of Work. This obligation of the Contractor to correct the Work shall survive acceptance of the Work under the Contract and termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

Nothing contained in this warranty shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the time period of ___ year(s), or special extended time periods required by the Contract Documents, for correction of the Work as described above relates only to the specific obligation of the Contractor to correct the work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

In the event of the Contractor's failure to comply with the conditions of this warranty within 5 days after being notified in writing by the Owner or his agent, the Contractor hereby authorizes the Owner to proceed to have said defects repaired and made good at the Contractor's expense and the Contractor will honor and pay the costs and charges therefore upon demand.

The term "Work" means the construction and services required by the Contract Documents and includes all other labor, materials, equipment and services provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or part of the total construction performed under the Contract Documents.

Date _____

_____
Contractor

_____
Address

_____

_____
Telephone

_____
Signature of Contractor

_____
Title

SUBCONTRACTOR WARRANTY

Project: BCSD – Campus Infrastructure Upgrades
Mt Vernon Elementary School
Owner: Bakersfield City School District
Architect: AP Architects
Contractor:
Inspector:

Date:
File No:
Project No: 566-0020
DSA Appl No:

_____ (Subcontractor) hereby warrants to _____ (General Contractor) that materials and equipment furnished under the Contract, pursuant to Specifications Section(s) _____ in the _____ (Name of Project) are of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work is free from defects not inherent in the quality required or permitted, and that the Work conforms with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. This warranty excludes remedy or damage or defect caused by abuse, modifications not executed by the Subcontractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage.

If, within __ year(s) after the date of Notice of Completion of the Work or designated portion thereof, or by terms of an applicable special warranty required by the Contract Documents extending this time period, and of the Work is found to be not in accordance with the requirements of the Contract Documents or proves to be defective in materials or workmanship, the Subcontractor expressly agrees to correct it, without expense to the Owner, promptly after receipt of written notice from the Contractor to do so unless the Owner has previously given the Contractor written acceptance of the condition. This period of __ year (s) shall be extended with respect to portions of the Work first performed after Notice of Completion by the period of time between Notice of Completion and the actual performance of Work. This obligation of the Subcontractor to correct the Work shall survive acceptance of the Work under the Contract and termination of the Contract. The Contractor shall give such notice promptly after discovery of the condition.

Nothing contained in this warranty shall be construed to establish a period of limitation with respect to other obligations which the Subcontractor might have under the Contract Documents. Establishment of the time period of __ year(s), or special extended time periods required by the Contract Documents, for correction of the Work as described above relates only to the specific obligation of the Subcontractor to correct the work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Subcontractor's liability with respect to the Subcontractor's obligations other than specifically to correct the Work.

In the event of the Subcontractor's failure to comply with the conditions of this warranty within 5 days after being notified in writing by the Contractor, the Subcontractor, hereby authorizes the Contractor to proceed to have said defects repaired and made good at the Subcontractor's expense and the Subcontractor will honor and pay the costs and charges therefore upon demand.

The term "Work" means the construction and services required by the Contract Documents and includes all other labor, materials, equipment and services provided by the Subcontractor to fulfill the Subcontractor's obligations. The Work may constitute the whole or part of the total construction performed under the Contract Documents.

Date _____

_____
Contractor

_____
Address
_____

_____
Telephone

_____
Signature of Contractor

_____
Title

SECTION 018000 – CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING 04/11/16

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 0 &1 Specification Sections, apply to this Section.

1. Standard details and requirements per jurisdiction requirements, not limited to herein.

1.2 SUMMARY

A. This Section includes, but not limited to, construction waste diversion and related items.

1. Establish a Construction Waste Management (CWM) plan for the diverted materials, or meet local construction and demolition waste management ordinance, whichever is more stringent.
2. Construction Waste Management (CWM) worksheet(s).
3. Construction Waste Management (CWM) acknowledgement.
4. Miscellaneous and related forms as required by local jurisdiction and Owner.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section “Project Closeout” for required closeout documents.
2. Division 2 Section “Selective Demolition” for related items.

1.3 SUBMITTAL

A. General: Submit for approval prior to initial pay application submission the following in accordance with Conditions of Contract and Division 1 Specification Sections.

1. Construction Waste Management Plan.
2. Construction Waste Management Worksheet(s).
3. Construction Waste Management Acknowledgement.
4. Copies of all applications, permits and related requirements, not limited to, herein and local jurisdiction requirements.
5. Project Closeout Requirements:

a. Copies of all completed forms required herein
b. Compilation of Construction Waste Management (CWM) worksheet(s).
c. Receipts to document diversion.

B. Project Closeout Checklist

1. Construction Waste Management Plan
2. Construction Waste Management Worksheet(s)
3. Construction Waste Management Acknowledgement
4. Final diversion report with receipts

1.4 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:

1. Title 24, Part 1 CCR 2013, Chapter 5 (California Green Building Standard Code)

B. Refer to Division 2 Section "Selective Demolition", for additional requirements.

B. Refer to Division 2 Section “Building Demolition” for additional requirements.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION

3.1 CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING

A. Construction waste diversion. Establish a construction waste management plan for the diverted materials, or meet local construction and demolition waste management ordinance, whichever is more stringent.

B. Construction waste management plan (CWMP). Where a local jurisdiction does not have a construction and demolition waste management ordinance, submit a construction waste management plan for approval by the District that:

1. Identifies the materials to be diverted from disposal by efficient usage, recycling, reuse on the project or salvage for future use or sale.
2. Determine if materials will be sorted on-site or mixed.
3. Identifies diversion facilities where materials collected will be taken.
4. Specifies that the amount of materials diverted shall be calculated by weight or by volume, but not both.
5. See sample forms at end of section.

C. Documentation. Documentation shall be provided to the enforcing agency which demonstrates compliance with herein. The waste management plan shall be updated as necessary and shall be accessible during construction for examination by the District and Architect.

D. Construction waste reduction of at least 65 percent. Recycle and/ or salvage for reuse a minimum of 65 percent of the non- hazardous construction and demolition debris, or meet a local construction and demolition waste management ordinance, whichever is more stringent. Calculate the amount of materials diverted by weight or volume, but not both.

Exceptions:

1. Excavated soil and land-clearing debris.

E. Excavated soil and land clearing debris. 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed, if approved by the District and Architect within 30 days of Notice to Proceed.

3.2 DISPOSAL OF WASTE/ DEMOLISHED MATERIALS

A. Remove from building site debris, rubbish, and other materials resulting from demolition operations. Transport and legally disposed off site per Construction Waste Management Plan.

1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
2. Burning of removed materials is not permitted on project site.

B. Demolition Permits and Disposal Requirements (Sample forms at end section):

1. The District requires diversion of 65% of discarded materials from landfills, reusing for compliance with AB 939 goals. Contractor shall secure a demolition permit with local jurisdiction as prescribed in Section 002113 “Instructions to Bidders”. The following requirements are:

    a. Prepare Construction Waste Management Plan.
    b. Provide for all Contractor, subcontractor, vendor, workers a Construction Waste Management Acknowledgement. Keep files at project site. Provide copies for Project Closeout.
    c. Complete Construction and Demolition Recycling Program Application as required by local jurisdiction. Verify requirements prior to bidding.
    d. Inform all sub-contractors, vendors and employees about the recycling requirements, as Contractor will be held responsible for any materials they take away from the job site. Document acknowledgement with Construction Waste Management Acknowledgement Report. In order for Contractor to comply with recycling requirements, vendors, employees and subcontractors must take materials to an approved disposal/ recycling site and keep copies of disposal tickets for diversion rate.

        1. Track waste by weight or volume, but not both.

    e. Compliance: District will not accept project until it is determined that the Construction and Demolition waste/disposal has fully complied with the diversion requirements and recycling guidelines.
    f. Non-Compliance: If the Contractor fails to adhere to the Construction and Demolition Recycling Plan, the applicant will not receive project acceptance.
    g. Contractor shall complete a Construction Waste Management Worksheet for documenting compliance with the Waste Management Plan after completion of project, as a precedent to project acceptance.

B. Demolition Permits and Disposal Requirements:

1. The local jurisdiction requires diversion of 65% of discarded materials from landfills, reusing for compliance with AB 939 goals. Contractor shall secure a demolition permit as prescribed in Section 002113 “Instructions to Bidders”. The following requirements are:

    a. Complete Construction and Demolition Recycling Program Application.
    b. The franchise hauler Mid Valley Disposal shall be the exclusive service provider for roll-off service and shall transport the Construction and Demolition material to their transfer station located at 15300W. Jensen Avenue, Kerman, California, for all projects that require a permit to build or deconstruct to spate material and divert a minimum of sixty-five percent (65%) of Construction and Demolition material form projects. Inform all sub-contractors, vendors and employees about the recycling requirements, as Contractor will be held responsible for any materials they take away from the job site. In order for Contractor to comply with recycling requirements, vendors, employees and subcontractors must take materials to Mid Valley Disposal and keep copies of weight tickets for diversion rate.
    c. Compliance: If the local entity determines that the Construction and Demolition has fully complied with the diversion requirements and recycling guidelines, the local entity will provide final inspection and/or certificate of occupancy.
    d. Non-Compliance: If the Contractor fails to adhere to the Construction and Demolition Recycling Plan, the applicant will not receive final inspection and/or certificate of occupancy.
    e. Contractor shall complete a Waste Reduction and Recycling Report (WRRR) after completion of project, as a precedent to final inspection and/or issuance of any certificate of occupancy is approved by local entity.

END OF SECTION 018000

CONSTRUCTION WASTE MANAGEMENT (CWM) PLAN

Note: This sample form may be used to assist in documenting compliance with the waste management plan.

Project Name: _____
Job #: _____
Project Manager: _____
Waste Hauling Company: _____
Contact Name: _____

All Subcontractors shall comply with the project's Construction Waste Management Plan.
All Subcontractor foremen shall sign the CWM Plan Acknowledgement Sheet.

Subcontractors who fail to comply with the Waste Management Plan will be subject to backcharges or withholding of payment, as deemed appropriate. For instance, Subcontractors who contaminate debris boxes that have been designed for a single material type will be subject to backcharge or withheld payment, as deemed appropriate.

1. The project's overall rate of waste diversion will be _____ %.
2. This project shall generate the least amount of waste possible by planning and ordering carefully, following all proper storage and handling procedure to reduce broken and damaged material and reusing materials whenever possible. The majority of the waste that is generated on this jobsite will be diverted from the landfill and recycled for other use.
3. Spreadsheet 1, enclosed, identifies the waste materials that will be generated on this project, the diversion strategy for each waste type and the anticipated diversion rate.
4. Waste prevention and recycling activities will be discussed at the beginning of weekly subcontractor meetings. As each new subcontractor comes on-site, the WMP Coordinator will present him/her with a copy of the CWM Plan and provide a tour of the jobsite to identify materials to be salvaged and the procedure for handling jobsite debris. All Subcontractor foremen will acknowledge in writing that they have read and will abide by the CWM Plan. Subcontractor Acknowledgement Sheet enclosed. The CWM Plan will be posted at the jobsite trailer.
5. Salvage: Excess materials that cannot be used in the project, nor returned to the vendor, will be offered to site workers, the owner, or donated to charity if feasible.
6. _____ [HAULING COMPANY] will provide a commingled drop box at the jobsite for most of the construction waste. These commingled drop boxes will be taken to [Sorting Facility Name and Location]. The average diversion for commingled waste will be _____%. As site conditions permit, additional drop boxes will be used for particular phases of construction (e.g. concrete and wood waste) tp ensure the highest waste diversion rate possible.
7. In the event that the waste diversion rate achievable via the strategy described in (6) above, is projected to be lower than what is required, then a strategy of source-separated waste diversion and/or waste stream reduction will be implemented. Source separated waste refers to jobsite waste that is not commingled but is instead allocated to a debris box designated for a single material type, such as clean wood or metal.
   Notes:
   a. Waste stream reduction refers to efforts taken by the builder to reduce the amount of waste generated by the project to below four (4) pounds per square foot of building area.
   b. When using waste stream reduction measures, the gross weight of the product is subtracted from the base weight of four (4) pounds per square foot of building area. This reduction is considered additional diversion and can be used in the waste reduction percentage calculations.
8. _____[HAULING COMPANY] will track and calculate the quantity (in tons) of all waste leaving the project and calculate the waste diversion rate for the project. [HAULING COMPANY] will provide Project Manager with an updated monthly report on gross weight hauled and the waste diversion rate being achieved on the project. [HAULING COMPANY's] monthly report will track separately the gross weights and diversion rates for commingled debris and for each source –separated waste stream leaving the project. In the event the [HAULING COMPANY] does not service any or all of the debris boxes on the project, the [HAULING COMPANY] will work with the responsible parties to track the material type and weight (in tons) in such debris boxes in order to determine waste diversion rates for these materials.
9. In the event that the Subcontractors furnish their own debris boxes as part of their scope of work, such Subcontractors shall not be excluded from complying with the CWM Plan and will provide [HAULING COMPANY] weight and waste diversion data for their debris boxes.
10. In the event that site use constraints (such as limited space) restrict the number of debris boxes that can be used for collection of designed waste the project Superintendent will, as deemed appropriate, allocate specific areas onsite where individual material types are to be consolidated. These collection points are not to be contaminated with non-designated waste types.
11. Debris from jobsite office and meeting rooms will be collected by [DISPOSAL SERVICE COMPANY]. [DISPOSAL SERVICE COMPANY] will, at a minimum recycle office paper, plastic, metal and cardboard.

CONSTRUCTION WASTE MANAGEMENT (CWM) WORKSHEET

Note: This sample form may be used to assist in documenting compliance with the waste management plan.

Project Name: _____

Job Name: _____

Project Manager: _____

Waste Hauling Company: _____

Construction Waste Management (CWM) Plan

WASTE MATERIAL TYPE	DIVERSION METHOD		PROJECTED DIVERSION RATE
	COMMINGLED AND SORTED OFF SITE	SOURCE SEPARATED ON SITE	
Asphalt			
Concrete			
Shotcrete			
Metals			
Wood			
Rigid Insulation			
Fiberglass Insulation			
Acoustic ceiling tile			
Gypsum drywall			
Carpet/ carpet pad			
Plastic pipe			
Plastic buckets			
Plastic			
Hardiplank siding and boards			
Glass			
Cardboard			
Pallets			
Job office trash, paper, glass & plastic bottles, cans, plastic			
Alkaline and rechargeable batteries, toner cartridges and electronic devices			
Others:			
Others:			
Others:			
Others:			
Others:			

CONSTRUCTION WASTE MANAGEMENT (CWM) ACKNOWLEDGE

Note: This sample form may be used to assist in documenting compliance with the waste management plan.

Project Name: _____

Job Name: _____

Project Manager: _____

Waste Hauling Company: _____

CWM Plan Acknowledgement

The Foreman for each new Subcontractor that comes on site is to receive a copy of the Construction Waste Management Plan and complete this Acknowledgement Form.

I have read the Waste Management Plan for the project; I understand the goals of this plan and agree to the follow the procedures described in this plan.

DATE	SUBCONTRACTOR COMPANY NAME	FOREMAN NAME	SIGNATURE

SECTION 018100- STORM WATER POLLUTION PREVENTION PLAN 11/07/16

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 0 &1 Specification Sections, apply to this Section.

1. Standard details and requirements per jurisdiction requirements, not limited to herein.

1.2 SUMMARY

A. This Section includes, but not limited to, erosion and sedimentation controls and related items.

1. Provide “Data Submitter” information to Legal Responsible Person (LRP)-(District).
2. LRP creates project with “SMARTS” account. LRP will add “Data Submitter” to project.
3. Data Submitter to input / upload information for Permit Registration Documents (PRD’s).
4. LRP to submit PRD’s (SMARTS Protocol).
5. State of Water Resources Control Board (SWRCB) will send notification of fees for permit, issues with PRD’s and/ or Notice of Intent (NOI).
6. SWRCB will evaluate fees for permit. Permit for Waste Discharge/ Identification (WDID) number will be issued by SWRCB once fees are paid. LRP to pay fees for permit to SWRCB.
7. SWRCB notifies LRP of approval of Notice of Intent (NOI) (NOI can be viewed at SMARTS website).
8. Installation of temporary erosion control systems per PRD’s.
9. Installation of temporary slope protection systems per PRD’s.
10. Removal of temporary measures where required by SWPPP per PRD’s.
11. Signage and posting per requirements per PRD’s.
12. Annual report(s), file with SMARTS by Data Submitter.
13. Post-Construction water balance calculation by Data Submitter.
14. File Notice of Termination (NOT) upon completion of project with SMARTS by Data Submitter.
15. Data Submitter to notify LRP of NOT filing. LRP to submit NOT (SMARTS Protocol).
16. SWRCB to notify LRP NOI submitted.
17. Miscellaneous requirements per local jurisdiction.
18. TRPA BMP and coordination.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 Section “Summary of Work” for HCP requirements and related work.
2. Division 1 Section “Temporary Facilities” for additional PRD’s requirements.
3. Division 1 Section “ Project Closeout” for additional PRD’s requirements.
4. Division 31 Section “Earthwork” for related items.
5. Division 31 Section “Site Clearing” for related items.
6. Division 33 Section “Utility Materials” for related items.

1.3 REQUIREMENTS

A. The NOI and related fee shall be submitted electronically on the State Water Boards Stormwater Multi-Application and Report Tracking system (SMARTS) website, http://smarts.waterboards.ca.gov prior to the start of construction.

1. The Owner will pay the filing fee, when prompted by SMARTS and notification of Data Submitter fees are ready to be paid.

B. Definitions:

1. Data Submitter – prepares and inputs data for Contractor into SMARTS (paid by Contractor)
2. LRP: Legal Responsible Person (District)
3. PRD's: Permit Registration Document(s)
4. SMARTS: Stormwater Multi Application and Report Tracking System
5. NOI: Notice of Intent
6. NOT: Notice of Termination
7. SWRCB: State Water Resources Control Board
8. RWQCB: Regional Water Quality Control Board
9. WDID: Waste Discharge Identification
10. ATS: Active Treatment System

C. Standard PRD Requirements (All Dischargers) per SWRCB Requirements not limited to the following:

1. Notice of Intent
2. Risk Assessment (Standard or Site-Specific)
3. Site Map
4. SWPPP
5. Annual Fee (paid by LRP)
6. Certification

D. Additional PRD Requirements Related to Construction Type per SWRCB Requirements not limited to the following:

1. Discharger in unincorporated areas of the State (not covered under an adopted Phase I or II SUSMP requirements) and that are not a linear project shall also submit a completed:

a. Post-Construction Water Balance Calculator (Appendix 2, available online at SWRCB website).

2. Dischargers who are proposing to implement ATS shall submit:

a. Complete ATS Plan in accordance with Attachment F at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation.
b. Certification proof that design done by a professional in accordance with Attachment F (available online at SWRCB website).

3. Dischargers who are proposing an alternate Risk Justification:

a. Particle Size Analysis.

E. Description of PRDs per SWRCB Requirements not limited to the following:

1. Notice of Intent (NOI)
2. Site Map(s) Includes:

a. The project's surrounding area (vicinity)
b. Site layout
c. Construction site boundaries
d. Drainage areas

e. Discharge locations
f. Sampling locations
g. Areas of soil disturbance (temporary or permanent)
h. Active areas of soil disturbance (cut or fill)
i. Locations of all runoff BMPs
j. Locations of all erosion control BMPs
k. Locations of all sediment control BMPs
l. ATS location (if applicable)
m. Locations of sensitive habitats, watercourses, or other features which are not to be disturbed
n. Locations of all post-construction BMPs
o. Locations of storage areas for waste, vehicles, service, loading/unloading of materials, access (entrance/exits) points to construction site, fueling, and water storage, water transfer for dust control and compaction practices.

3. SWPPPs

a. A site-specific SWPPP shall be developed by each discharger and shall be submitted with the PRDs.

4. Risk Assessment - All dischargers shall use the Risk Assessment procedure as describe in the General Permit Appendix 1 (available online at SWRCB website).

a. The Standard Risk Assessment includes utilization of the following:

1) Receiving water Risk Assessment interactive map
2) EPA Rainfall Erosivity Factor Calculator Website
3) Sediment Risk interactive map
4) Sediment sensitive water bodies list

b. The Site-Specific Risk Assessment includes the completion of the hand calculated R value Risk Calculator

5. Post-Construction Water Balance Calculator - All dischargers subject to this requirement shall complete the Water Balance Calculator (in Appendix 2) in accordance with the instructions.
6. ATS Design Document and Certification - All dischargers using ATS must submit electronically their system design (as well as any supporting documentation) and proof that the system was designed by a qualified ATS design professional (see Attachment F – available online at SWRCB website).

F. Information For additional information contact:

Regional Water Quality Control Board
Fresno Branch Office
1685 East Street
Fresno, CA 93706
(559) 445-5116

1. If this project transverses more than one Regional Water Quality Control Board (RWQCB) jurisdiction, a complete Notice of Intent package (Notice of Intent, site map, and fee) and Notice of Termination (upon completion of each section), must be filed for each RWQCB.

G. Annual report required for projects under construction for more than one continuous 3 month period, no later than September 1, of each year. This shall be done on line via the SMARTS web site, see above, for the period July 1, to June 30. Provide information needed for overall program evaluation and public information.

1. Summary and evaluation of all sampling and analysis results
2. Laboratory reports referenced specifically to SWPPP
3. Summary of all corrective actions taken during the compliance year and identification of any compliance activities.

1.4 EROSION CONTROL AND SLOPE PROTECTION IMPLEMENTATION

A. Prevention Plan to be dictated by site conditions in order to maintain the intent of the specifications and permits at no additional cost to Owner.

B. Owner has authority to limit surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations and to direct Contractor to provide immediate permanent or temporary pollution control measures.

C. Maintain temporary erosion control systems as directed by Owner or governing authorities to control siltation during life of contract. Contractor shall respond to maintenance or additional work ordered by Owner or governing authorities within 48 hours or sooner if required at no additional cost to the Owner.

D. Slopes that erode easily or that will not be graded for a period of 14 days or more shall be temporarily seeded as work progresses with wheat, rye or oats application in accordance with City Standards unless otherwise specified on the Construction Drawings.

1.5 POSTING ON SITE

A. Post and maintain all notices per SWPPP requirements and requirements herein not limited to the following:

1. Construction trailer, post the following on a specific allocated board viewable by all parties to this project:

   a. NOI
   b. Permit
   c. Inspection report clipboard
   d. Site stabilization and Construction activity Dates log
   e. Rainfall log

2. Site

   a. Notice of permit and application
   b. Site map
   c. Contractor contact information.
   d. Sign that indicates the following, size 48” x 48”:

SWPPP
<u>Strictly Enforced</u>
You Must

- Comply with all Government Agency Requirements
- Use provided washout areas
- Keep mud off streets

Failure to comply will result in a minimum $1000 Fine.

END OF SECTION 018100

SECTION 311100- SITE CLEARING, STRIPPING, AND GRUBBING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:
   1. Clearing, stripping, and grubbing
   2. Removing surface debris.
   3. Removing designated paving, concrete slabs, curbs, gutters and fencing.
   4. Removing designated trees, shrubs, and other plant life.
   5. Removing abandoned utilities.
   6. Excavating topsoil.

B. Related Sections include but are not necessarily limited to:
   1. Section 31 23 00 – Earthwork.

1.2 SUBMITTALS

A. See Section 01 3300 – Submittal Procedures for general submittal requirements and content.

B. Product Data: Submit data for herbicide. Indicate compliance with applicable codes for environmental protection.

1.3 DESCRIPTION

A. Clearing:
   1. Remove and dispose of concrete curbs, gutter and slabs; asphalt concrete pavement and other hardscape improvements as shown on the plans and in conflict with proposed construction, and as directed by Geotechnical engineer.
   2. Remove and dispose of trees, snags, stumps, shrubs, brush, limbs, sticks, branches and other vegetative growth in conflict with proposed construction, and as directed by Geotechnical engineer.
   3. Remove and dispose of rocks, tiles, trash piles, rubbish, and fencing in conflict with proposed construction, and as directed by Geotechnical engineer.
   4. Protect structures and piping above and below ground, trees, shrubs, vegetative growth and fencing not designated for removal. Repair and replace any items damaged by contractor’s operations at contractor’s expense as directed by Engineer and approved by Governing Authority.

B. Stripping:
   1. Remove and dispose of organic sod, topsoil to a minimum depth of 2-inches, grass and grass roots, and other objectionable material, and as directed by Geotechnical engineer.

C. Grubbing:
   1. After clearing and stripping, remove and dispose of wood or root matter, including stumps, logs, trunks, roots, or root systems greater than 1.5 inches in diameter or thickness to a depth of 3-feet below the ground surface, and as directed by Geotechnical engineer.

1.4 QUALITY ASSURANCE

A. Conform to Kern County Standards, Owner standards, and geotechnical engineer’s requirements

PART 2 PRODUCTS

2.1 MATERIALS

A. Trees and Shrubbery: Existing trees, shrubbery and other vegetative material may not be shown in the plans. Inspect the site as to the nature, location, size and extent of vegetative material to be preserved or removed, as specified herein.

PART 3 EXECUTION

3.1 PREPARATION

A. Call Local Utility Line Information service at 811 not less than 48 hours before performing Work.

B. Verify location of existing utilities and benchmarks before starting work.

C. Verify existing plant life designated to remain is tagged or identified.

3.2 PROTECTION

A. Protect existing trees and other vegetation to remain against damage.
   1. Do not smother trees by stockpiling construction materials or excavated materials within drip line.
   2. Avoid foot or vehicular traffic or parking of vehicles within drip line.
   3. Provide temporary protection as required.

B. Repair or replace trees and vegetation damaged by construction operations.
   1. Repair to be performed by a qualified tree surgeon.
   2. Remove trees that cannot be repaired and restored to full-growth status and replace with new trees of minimum 4-inch caliper.

C. Protect utilities, benchmarks, and survey control points from damage or displacement.

3.3 UTILITIES

A. Locate, identify, disconnect, and seal or cap off utilities identified for removal.
   1. Arrange with utility companies to shut off indicated utilities.

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 5 working days in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without Architect’s written permission.
   3. Any utilities damaged, removed, or undercut by construction operations shall be repaired or replaced at contractor’s expense.

C. Excavate for and remove underground utilities identified for removal.
   1. Backfill excavations in accordance with Soils Report recommendations.

3.4 SITE CLEARING

A. Topsoil Removal:
   1. Strip topsoil to depths encountered.
      a. Remove heavy growths of grass before stripping.

b. Stop topsoil stripping sufficient distance from such trees to prevent damage to main root system.
c. Separate from underlying subsoil or objectionable material.

2. Stockpile topsoil where directed by Engineer.
   a. Construct storage piles to freely drain surface water.
   b. Seed or cover storage piles to prevent erosion in compliance with SWPPP.
3. Do not strip topsoil in wooded areas where no change in grade occurs.
4. Borrow topsoil: Reasonably free of subsoil, objects over 2-inch DIA, weeds and roots.

B. Clearing and Grubbing:
   1. Clear from within limits of construction all trees.
      a. Include shrubs, brush, downed timber, rotten wood, heavy growth of grass and weeds, vines, rubbish, structures and debris.
   2. Grub (remove) from within limits of construction all stumps, roots, root mats, logs and debris encountered.
      a. Totally grub under areas to be paved and all lawn areas.

C. Disposal of Waste Materials:
   1. Do not burn combustible materials on site.
   2. Remove all waste materials from site and dispose in a legal manner.
   3. Do not bury organic matter on site.

3.5 SITE IMPROVEMENTS

A. Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
   1. Concrete and Asphalt Paving: Cleanly saw-cut vertically and in straight lines, perimeter of area to be removed, then break up and remove portion indicated.
      a. At concrete paving, use existing joints to define area of removal, unless indicated otherwise.
   2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

3.6 ACCEPTANCE

A. Upon completion of the site clearing, obtain Engineer's acceptance of the extent of clearing, depth of stripping and rough grade.

END OF SECTION

SECTION 312300- EARTHWORK

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Materials, testing, and installation for excavations, fills, and backfills.

B. Related Sections include but are not necessarily limited to:

1. Section 31 1100 – Site Clearing, Stripping and Grubbing.

1.02 REFERENCES

A. ASTM International (ASTM):

1. D1556 – Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
2. D1557 – Standard Test Methods for Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. Rammer and 18-Inch Drop.
3. D2167 – Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
4. D2487 – Standard Test Method for Classification of Soils for Engineering Purposes.
5. D2488 – Practice for Description and Identification of Soils (Visual-Manual Procedure).
6. D2937 – Test Method for Density of Soil in Place by the Drive-Cylinder Method.
7. D2974 – Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
8. D6938 – Standard Test Methods for Density and Moisture Content of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth).
9. E699 – Criteria for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating Building Components in Accordance with Test Methods Promulgated by ASTM.

B. California Department of Transportation Standard Specifications, current edition (current edition):

1. CTM 216 Dry – California Test Method for Relative Compaction of Treated and Untreated Soils.
2. CTM 301 – California Test Method for the Determination of the Resistance “R” Value of Treated and Untreated Bases, Sub-bases, and Basement soils by the Stabilometer.

1.03 DEFINITIONS

A. Excavation consists of removal of material encountered during stripping and as required for removal of existing underground facilities indicated. It also includes disposal or temporary stockpile of material removed.

B. Unauthorized excavation consists of removal of materials beyond indicated elevations or dimensions without specific direction of the Contract Administrator. Unauthorized

excavation, as well as remedial work directed by the Contract Administrator, shall be at Contractor's expense.

1. Backfill and compact unauthorized excavations as specified for authorized excavations of the same classification, unless otherwise directed by the Geotechnical engineer.

C. Additional Excavation:

1. When excavation has reached required subgrade elevations; notify the Geotechnical engineer who will make an inspection of conditions. If the Geotechnical engineer determines bearing materials at required subgrade elevations are unsuitable, continue excavation until suitable bearing materials are encountered and replace excavated material as directed by the Geotechnical engineer.

D. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular subbase, drainage fill, or topsoil materials.

E. Structure: Foundations, slabs, tanks, vaults, or other man-made stationary features occurring above or below ground surface.

F. Stripping: Removal of the topsoil, surface vegetation and any miscellaneous obstructions prior to site grading.

G. Over-excavation: Over-excavation is generally reserved for soils that in their natural state will not provide adequate bearing capacity for structures.

H. Engineered Fill: Fill Material upon which the geotechnical engineer have made sufficient tests and observations to enable them to issue a statement that, in their opinion, the fill has been placed and compacted in accordance with the specification requirements and to the satisfaction of the Engineer.

I. Trench Backfill: Trench backfill shall consist of material placed between the pipe zone backfill/bedding and subgrade in paved areas or to the top of the trench in unpaved areas, unless otherwise shown or specified in the Contract.

1.04 SUBMITTALS

A. See Section 01 3300 – Submittal Procedures for general submittal requirements and content.

B. Submit excavation and shoring drawings for worker protection in accordance with the General Provisions.

C. Submit six copies for materials acceptance reports from an approved testing laboratory verifying that the material meets the project requirements at least two weeks prior to use.

D. Furnish copy of dust control permit to Owner prior to earthwork.

1.05 QUALITY ASSURANCE

A. Testing and Inspection Services: Onwer will employ and pay for a qualified independent geotechnical testing and inspection laboratory to perform soils testing and inspection services during earthwork operations.

B. Determine the density of soil in place by the sand cone method, ASTM D1556 or by nuclear method, ASTM D6938. Additional sand cones and densities will be required if the backfill material is visually variable. The minimum depth for the sand cone test hole shall be 12-inches. The minimum size shall be 8 inches, and size 16/30 or 10/20 silica sand shall be used. Compaction tests will be performed for each lift or layer.

C. Determine laboratory moisture-density relationship of soils per ASTM D1557 or Cal 216 Dry test methods. If nuclear methods are used for in-place density determination, the compaction test results for maximum dry density and optimum water content shall be adjusted in accordance with ASTM D4718. This will be required for determination of percent relative compaction and moisture variation from optimum.

D. Determine the relative density of cohesion-less soils per ASTM D4253 and D4254.

E. Sample materials per ASTM D75.

F. "Relative compaction" is the ratio, expressed as a percentage, of the in-place dry density to the laboratory maximum dry density.

G. Compaction shall be deemed to comply with the specifications when no more than one test of any three consecutive tests falls below the specified relative compaction. The one test shall be no more than three percentage points below the specified compaction percentage and shall be within two percentage points of the optimum moisture as determined by the optimum moisture-density relationship of soils test method. The Contractor shall pay the costs of any retesting of work not conforming to the specifications.

1.06 DISPOSAL OF EXCESS MATERIALS

A. Excess materials and waste from earthwork operations shall be legally disposed of off-site by the Contractor at his expense. The District has not determined or secured any sites or permits for disposal of excess material or waste.

1.07 MATERIAL AVAILABILITY

A. Sufficient earthwork material to complete the work is available at the site. Excess material haul-off is required.

PART 2 – PRODUCTS

2.01 ENGINEERED FILL

A. Engineered Fill is material to be placed beneath structures or pavements to the limits indicated on the drawings.

B. Engineered Fill material shall be free of organics and other debris and less than 3-inches in maximum dimension. Native soils may be used if they contain objects less than 3-inch in maximum dimension and contain less than 3 percent organic materials by weight (ASTM D2974), or as defined in Geotechnical Investigation.

C. Import Fill to be used as Engineered Fill shall be non-hazardous, non-corrosive, be derived from a single, consistent source and meet the following criteria in geotechnical report.

1. Gradation (ASTM C136)
2. Expansion index (ASTM D4829)
3. Plasticity (ASTM D4318)
4. Organic Content (ASTM D2974)
5. Corrosivity Potential (pH, Minimum resistivity (ohm-cm), Soluble Sulfate (ppm), Soluble Chloride (ppm))
6. Resistance Value (CTM 301)

2.02 ENGINEERED BACKFILL

A. Engineered Backfill is material to be placed adjacent to and around piping, structures, and areas not subject to adjacent structure foundation loading (areas not subject to adjacent structure foundation loading are areas from a distance 5-feet beyond the edge of structural slab or footing).

B. Engineered Backfill and Imported Fill to be used as Engineered Backfill shall comply with the requirements of Engineered Fill, or as defined in Geotechnical Investigation.

2.03 FILL

A. Fill material is material that is to be placed in locations that are not to be constructed as engineered fill or backfill, or as defined in Geotechnical Investigation.

2.04 SAND

A. Sand is granular material free from clay balls, organic matter, and other deleterious substances.

B. Sand shall be of such size that 90 percent to 100 percent will pass the number 4 sieve and not more than 5 percent will pass the number 200 sieve per Caltrans Sand bedding specification.

C. Sand shall have a minimum sand equivalent of 30 per ASTM D2419.

2.05 WATER FOR COMPACTION

A. Water shall be free of organic materials and shall have a pH of 7.0 to 9.0, a maximum chloride concentration of 500-mg/L, and a maximum sulfate concentration of 500-mg/L. Provide all water needed for earthwork. Provide temporary piping and valves to convey water from the source to the point of use. Provide any meters if the water is taken from a city, water district, or agency pipeline.

PART 3 – EXECUTION

3.01 LIMITS OF FOUNDATION EXCAVATION

A. Excavate to the depths and widths needed to accomplish the construction. Allow for forms, working space, engineered backfill, and site grading. Do not excavate for footings, slabs, or conduits below elevations indicated. Unless unacceptable material is encountered and over-excavation is authorized by the Owner, backfill over-excavations with compacted Engineered Backfill material. Correct cuts below grade by benching adjoining areas and creating a smooth transition. The Contractor shall bear all costs for correcting unauthorized over-excavated areas.

3.02 PREPARATION FOR PLACING FILL OR BACKFILL

A. Remove foreign materials and trash from the excavation before backfilling.

B. Scarify the final subgrade surface to a depth of 12-inches, uniformly moisture condition to or above optimum moisture content, proof-roll to detect soft areas, and compact to 95% relative compaction beneath structures, vaults, and equipment pads, or as required in Geotechnical Investigation.

3.03 PLACING AND COMPACTION FILL AND ENGINEERED FILL

A. Excavated material may be used for fill and engineered fill providing materials meet the specified requirements for structure fill, backfill, and fill material.

B. Place in maximum 6-inch lifts, moisture condition to 2% of optimum, and compact each lift to a minimum 90% relative compaction, or as required in Geotechnical Investigation.

C. Where fill is to be constructed on slopes steeper than 5:1, bench the fill into competent undisturbed materials as the fill progresses up the slope. Benches shall be sloped at least 2% into the slope and shall be of a width at least equal to the height of fill lift.

3.04 PREPARATION OF FOUNDATION SUBGRADE

A. The finished subgrade for foundations and equipment slabs shall be within a tolerance of ±0.08 of a foot of the grade and cross section indicated, shall be smooth and free from irregularities, and shall be at the specified relative compaction.

B. Compact the top 12-inches of the subgrade to 95% relative compaction unless noted otherwise on the drawings, or as required in Geotechnical Investigation. Recompaction will not be required if rock is exposed at final subgrade.

C. Remove soft material encountered and replace with engineered backfill. Fill holes and depressions to the required line, grade, and cross sections with engineered backfill, or as required in Geotechnical Investigation.

D. If rock is encountered at final grade, over-excavate to a depth of 6-inches and place engineered backfill to establish final grade, or as required in Geotechnical Investigation.

3.05 PREPARATION OF PAVEMENT AND SIDEWALK SUBGRADE

A. Any uncertified fill material encountered within pavement or sidewalk areas should be removed and/or recompacted. The fill material should be moisture-conditioned to near optimum and recompacted to a minimum of 90% maximum dry density. At a minimum the upper 12-inches of subgrade soil shall be scarified, moisture-conditioned and recompacted, or as required in Geotechnical Investigation.

3.06 MOISTURE CONTROL

A. During the compacting operations, maintain optimum practicable moisture content required for compaction purposes in each lift of the material. Maintain uniform moisture content throughout the lift. Insofar as practicable, add water to the material at the site of excavation. Supplement by sprinkling the material. At the time of compaction, the water content of the material shall be at optimum water content or within 2 percentage points above optimum. Aerate material containing excessive moisture by blading, discing, or harrowing to hasten the drying process.

3.07 SITE GRADING

A. Perform earthwork to the lines and grades shown in the drawings. Remove exposed roots and loose rocks exceeding 1/4-inches in diameter. Neatly and smoothly trim rounded surfaces.

3.08 MAINTENANCE

A. Protection of Graded Areas: Graded areas shall be protected and kept free of trash and debris.

B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape and compact to required density prior to further construction.

D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact and replace surface treatment. Restore appearance, quality and condition of surface or finish to match adjacent work and eliminate evidence of restoration to greatest extent possible.

E. Maintain dust control on a continuous basis in accordance with the Standard Specifications.

3.09 EXCAVATION NEAR EXISTING UTILITIES AND STRUCTURES

A. As the excavation approaches pipes, conduits, or other underground structures, not designated for demolition or specifically designated to preserve, discontinue digging by machinery and excavate by means of hand tools. Such manual excavation is incidental to normal excavation and is included in the work to be done under items involving normal excavation.

B. Where determination of the exact location of a pipe or other underground structure is necessary for doing the work properly, excavate test pits to determine such locations. Such test pits are incidental to other excavation, and the work is understood to be included as a part of the excavation.

C. Existing Structures: Support and protect from damage all existing pipes, poles, wires, fences, guard rails, curbing, catch basins, manholes, property line markers, and other structures which do not require temporary or permanent relocation.

D. Restore or replace damaged items, without compensation, to the condition in which they were found immediately before the work under this project was begun.

E. Survey Monuments: Replace survey monuments that are disturbed or removed. Work shall be performed by a Licensed Land Surveyor at the Contractor’s expense.

3.10 CARE AND RESTORATION OF PROPERTY

A. General: Do not operate tractors, bulldozers or other power-operated equipment on paved surfaces if the treads or wheels of the equipment are so shaped as to cut or otherwise injure the surfaces.

B. Restore all surfaces, including planted areas, which have been injured by the Contractor's operations, to a condition at least equal to that in which they were found immediately before the work was begun. Use suitable materials and methods for such restoration. Maintain all restored plantings by cutting, trimming, fertilizing, etc., until acceptance. Restore existing property or structures as promptly as practicable and do not leave until the end of construction period.

3.11 EROSION CONTROL

A. Comply with the requirements of the governing agencies, California Green Code, and Kern County Code of Building Regulations.

3.12 DUST CONTROL:

A. Take preventative measures to control dust emissions including but not limited to the following:

1. Apply water to all unpaved areas as required to prevent the surface from becoming dry enough to permit dust formation.
2. Keep paved surfaces over which vehicular traffic is permitted to travel free of dirt. In residential areas, use a self-contained, pick-up type, power broom with water distribution system.

B. Temporary suspension of the work, either as a result of order by the Engineer, or as a result of conditions beyond the control of the Contractor shall not relieve the Contractor from his responsibility for dust control as set forth herein.

C. Comply with the requirements of the BMP Plan, if applicable, California Green Code, San Joaquin Valley Air Pollution Control District, and Kern County Code of Building Regulations.

3.13 COMPACTION:

A. Comply with the compaction requirements are shown on the plans and specified herein.

END OF SECTION

SECTION 312333- UTILITY TRENCHING AND BACKFILL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes:
   1. Excavating and backfilling trenches for below-grade utility lines.

B. Related Sections include:
   1. Division 26 Sections for underground electrical lines both below and outside building areas.
   2. Section 31 10 00 “Site Clearing” for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
   3. Section 31 20 00 “Earthwork” for general earthwork, including excavating and filling, and grading.
   4. Section 32 13 13 “Site Concrete” for concrete paving and underlying base course material, and patching of existing concrete paving above utility trenches.
   5. Division 33 Sections for underground site utility lines outside of building areas.

1.3 REFERENCES

A. ASTM International:
   1. ASTM C 33: Standard Specification for Concrete Aggregates.
   2. ASTM D 1556: Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
   3. ASTM D 1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3).
   4. ASTM D 2167: Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
   5. ASTM D 2937: Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
   6. ASTM D 2487: Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
   7. ASTM D 6938: Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

B. California Code of Regulations:
   1. Title 8 – Industrial Relations (Cal/OSHA Standards).

1.4 DEFINITIONS

A. Backfill: Soil material or controlled-low-strength material used to fill an excavation.
   1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
   2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Course placed between the subgrade and surface pavement in a paving system.

C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe, and initial backfill over pipe and conduit.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Owner's geotechnical testing agency. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Owner's geotechnical testing agency. Unauthorized excavation, as well as remedial work directed by geotechnical agency, shall be without additional compensation.

F. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

G. Subgrade: Uppermost surface of an excavation, or top surface of a fill or backfill immediately below base course, drainage course, or topsoil materials.

H. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.5 ACTION SUBMITTALS

A. Product Data: For the following:

1. Each type of plastic warning tape.

B. Soil Samples: As required by Owner's geotechnical testing agency for sampling and testing of proposed offsite borrow soil material.

1. Deliver a representative sample of each type of imported borrow material to Owner's geotechnical testing agency's laboratory at least 7 working days prior to delivery to site, for evaluation and testing.

1.6 QUALITY ASSURANCE

A. Geotechnical Testing and Inspection: Owner will employ and pay for a qualified independent geotechnical testing and inspection agency to perform soils testing and inspection services during utility trenching and backfill operations. All imported borrow materials must be approved by Owner's geotechnical testing agency.

1.7 FIELD CONDITIONS

A. Existing Utilities: Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.

1. Should uncharted, or incorrectly charted piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation, if required. Repair damage utilities to satisfaction of utility owner.

2. Do not interrupt existing utilities serving facilities occupied by Owner or others, during occupied hours, except when permitted in writing by Owner and utility company, and then only after acceptable temporary utility services have been provided.
    a. Provide minimum 5 working days notice to Owner and utility company, and receive written notice to proceed before interrupting any utility.
3. Demolish and completely remove from site existing underground utilities identified for removal. Coordinate with utility companies for shutoff of services if lines are active.

B. Use of explosives is not permitted.

C. Protection of Persons and Property:
1. Barricade open excavations and post with warning lights as per requirements of authorities having jurisdiction.
    a. Conform with all applicable occupational safety regulations.
2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
3. Excavation within dripline of trees to remain to be performed by hand. Protect root systems from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with moistened burlap. Refer to Division 1 Section for tree- and plant-protection for additional requirements.

D. Dust Control: Conduct trenching and backfill operations so as to prevent windblown dust and dirt from interfering with Owner's and adjacent property owners' normal operations.
1. The contractor shall prevent a dust nuisance from originating from the site of work as a result of his operations during the effective period of this contract. Preventative measures shall be taken by the contractor to mitigate the impact of dust and PM10 emissions according to the San Joaquin Valley Air Pollution Control District Regulation VIII (8).

E. Do not commence utility trenching until plant-protection measures specified in Section 01 56 39 Tree Protection and Trimming" are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM, or a combination of these groups; free of rock and gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter, or as directed by Geotechnical Engineer.

B. Sand Bedding Material: ASTM C 33; fine aggregate, natural, or manufactured sand.

2.2 MISCELLANEOUS MATERIALS

A. Controlled-Low-Strength Material: Refer to Section 31 23 26 "Controlled-Low-Strength Material."

2.3 ACCESSORIES

A. Detectable Warning Tape: Acid-resistant and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, 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 inches deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by trenching operations.

B. 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.

C. Refer to Section 31 10 00 ”Site Clearing” for removal of existing paving above utility trenches.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage caused by rain or water accumulation.

1. Remove surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary ditches.

3.3 EXCAVATION FOR UTILITY TRENCHES

A. Do not use explosives.

B. Unclassified Excavation: Excavation is unclassified and includes excavation to required subgrade elevations regardless of the character of materials and obstructions encountered.

C. Stability of Excavations:

1. Comply with all applicable local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations. Maintaining stability of excavations is sole responsibility of Contractor.

a. Support all trench and other excavations in accordance with California Code of Regulations, Title 8 – Industrial Relations (Cal/OSHA Standards), Chapter 4 – Division of Industrial Safety, Subchapter 4 – Construction Safety Orders.

D. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

2. Where trench runs parallel to perimeter edge of adjacent structure, do not locate trench excavations within distance to structure, such that any portion of structure, including footings, will occur above a plane projected at a slope of 1 vertical in 2 horizontal upward from any point in the excavation.

E. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit, or as otherwise indicated on plans.

F. Trench Bottoms: Excavate trenches 6 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe. Remove projecting stones and sharp objects along trench subgrade.

G. Trenches in Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Division 1 Section for tree protection.

3.4 SUBGRADE INSPECTION

A. Notify Owner’s geotechnical testing agency when excavations have reached required subgrade.

B. If Owner’s geotechnical testing agency determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed by geotechnical testing agency.

C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Owner’s geotechnical testing agency, without additional compensation.

3.5 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust and saturation from rain.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
2. Dispose of excess excavated soil material and materials not acceptable for use as backfill or fill. Comply with all applicable state and local requirements for offsite disposal of soil and other waste materials.

3.6 UTILITY TRENCH BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Surveying locations of underground utilities for Record Documents.
2. Testing and inspecting of underground utilities.
3. Removal of trash and debris from excavation.

4. Removal of temporary shoring and bracing, and sheeting.

B. Place bedding and backfill material on subgrades free of mud, frost, snow, and ice. Remove vegetation, topsoil, debris, wet, and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing backfill materials.

1. Scarify upper 6 inches of exposed soil at subgrade at bottom of trench to receive bedding material and backfill. Recompact scarified soil to a minimum of 90 percent relative compaction, at a moisture content within 2 percent of laboratory optimum value.

C. Place and compact sand bedding material on trench bottoms. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

1. Prevent displacement of piping or conduit by placing and compacting material uniformly on both sides around piping or conduit to approximately same elevation in each lift along entire length of piping or conduit.
2. Place bedding material to an elevation of 12 inches above top of pipe or conduit.
3. Compact each layer of bedding material at 90 percent relative compaction at at a moisture content within 2 percent above laboratory optimum value, according to ASTM D 1557.

D. Placement and Compaction of Backfill Material: Place to final subgrade elevation.

1. Use satisfactory soil material for trench backfill.
2. Place backfill materials in layers not more than 12 inches in loose depth.
3. Backfill voids with satisfactory soil material while removing shoring and bracing.
4. Soil Moisture Control: Uniformly moisten or aerate subgrade and each subsequent backfill soil layer before compaction to levels indicated.
5. Compact each layer of backfill soil material at 90 percent relative compaction at a moisture content of **3 to 5** percent above laboratory optimum value, according to ASTM D 1557, except as follows:
   a. Where occurring in paved areas, compact upper 12 inches of backfill soil material below paving at 95 percent relative compaction at a moisture content within 2 percent above laboratory optimum value.
   b. Where occurring within turf or planted areas, compact upper 18 inches of backfill soil material at 85 percent relative compaction at a moisture content within 2 percent laboratory optimum value.
6. Correct improperly compacted areas or lifts as directed by Owner’s geotechnical testing agency if soil density tests indicate inadequate compaction.
7. Where project conditions prevent the use of properly compacted soil material as backfill, obtain approval of Project Inspector and Owner’s geotechnical testing agency to use controlled-low-strength material in lieu of soil.

E. Trenches Under Footings: Where trenches pass under footings or are excavated within 18 inches of footings, fill to elevation of bottom of footings with controlled-low-strength material, as specified in Section 31 23 26 “Controlled-Low-Strength Material.”

F. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.7 PAVEMENT BASE COURSES

A. Place base courses under paved areas on prepared subgrade, in indicated thicknesses, or if not indicated, to match thickness of existing base course, and as specified in Section 32 12 16 “Asphalt Paving” and Section 32 13 13 ”Site Concrete.”

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing and observation.

1. Notify Owner's testing agency at least 2 working days prior to date when observation and testing services are needed.

B. Allow geotechnical testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Geotechnical testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench length, at a frequency of no less than 18 inches vertically, but no fewer than two tests.

D. When geotechnical testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

1. Additional testing and inspection required by failure to meet specified requirements will be at Contractor's expense.

3.9 PROTECTION

A. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.10 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, debris, and legally dispose of off Owner's property.

END OF SECTION

SECTION 321216- ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes:
   1. Hot-mix asphalt paving.
   2. Aggregate base course for asphalt paving.
   3. Patching of asphalt paving.
   4. Asphalt surface treatments.
      a. Slurry seal.
      b. Fog seal.
   5. Asphalt curbs.
   6. Asphalt speed bumps.
   7. Redwood header boards.

B. Related Sections include:
   1. Section 02 41 19 “Selective Demolition” for sawcutting and removal of existing asphalt paving.
   2. Section 31 20 00 “Earthwork” for preparation of subgrade below asphalt paving base course.
   3. Section 31 23 33 “Utility Trenching and Backfill” for trenching and backfill for below-grade utility lines below asphalt paving.
   4. Section 03 30 00 ”Cast-In Place Concrete” for concrete paving and base course.
   5. Section 32 17 13 “Wheelstops” for precast concrete wheelstops.
   6. Section 32 17 23 “Pavement Markings” for paint striping and marking on asphalt paving.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):
   1. AASHTO M 29: Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
   2. AASHTO M 301: Standard Specification for Joint Sealants, Hot-Poured, for Concrete and Asphalt Pavements.
   3. AASHTO T 168: Standard Method for Test for Sampling Bituminous Paving Mixtures.

B. ASTM International:
   1. ASTM D 692: Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.
   2. ASTM D 979: Standard Practice for Sampling Bituminous Paving Mixtures.
   3. ASTM D 1073: Standard Specification for Fine Aggregate for Asphalt Paving Mixtures.

4. ASTM D 1188: Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples.
5. ASTM D 1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3).
6. ASTM D 2041: Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.
7. ASTM D 2726: Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Asphalt Mixtures.
8. ASTM D 2950: Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
9. ASTM D 3549: Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
10. ASTM D 6690: Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

C. State of California Department of Transportation (Caltrans):
1. Standard Specifications, Current Edition.

D. Environmental Protection Agency (EPA).

E. Redwood Inspection Service (RIS).

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site, to review pertinent issues related to asphalt paving.
1. Review methods and procedures related to asphalt paving including, but not limited to, the following:
a. Proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
b. Review requirements for protection paving work, including restrictions of traffic during installation period and for remainder of construction period.
2. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.
1. Include technical data and tested physical and performance properties.
2. Job-Mix Designs: For each job mix proposed for the Work. Mix design report for Asphalt Concrete and Aggregate Base shall be sealed and signed by qualified professional engineer responsible for its preparation.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and testing agency.

B. Material Certificates: For each paving material, signed by manufacturer, and certifying that each material complies with specified requirements.

C. Material Test Reports: For each paving material, by a qualified testing agency.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing hot-mix asphalt paving materials, and with a record of successful in-service performance, as well as sufficient production capacity to produce required quantities.

B. Provide asphalt paving according to materials, workmanship, and other applicable requirements of the Caltrans Standard Specifications.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate care, or if the following conditions are not met:

1. Tack Coats: Minimum surface temperature of 50 deg F (10 deg C).
2. Slurry Coat: Minimum surface temperature of 50 deg F (10 deg C) at time of placement.
3. Asphalt Base Lifts: Minimum surface temperature of 45 deg F (7 deg C) and rising at time of placement
4. Asphalt Surface Course: Minimum surface temperature of 50 deg F (10 deg C) at time of placement.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Produce and install asphalt paving in accordance with applicable requirements of the State of California Department of Transportation (Caltrans), 2010 Standard Specifications, referred to herein as Caltrans Standard Specifications.

2.2 BASE COURSE AGGREGATE

A. Base Course Aggregate: Sound, angular crushed stone, gravel, or combination thereof conforming with requirements of Caltrans Standard Specifications Section 26 for Class 2 Aggregate Base.

2.3 AGGREGATES FOR ASPHALT PAVING

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, or crushed gravel.

C. Fine Aggregate: ASTM D 1073 or AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, or combination thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

2.4 ASPHALT MATERIALS

A. Asphalt Binder: Conform to requirements of Caltrans Standard Specifications Section 92 for Performance Graded Asphalt Binders, PG 64-10.

B. Tack Coat: Emulsified asphalt conforming with requirements of Caltrans Standard Specifications Section 94; Grade: SS-1, SS-1h, CSS-1, or CSS-1h.

C. Fog Seal: Emulsified asphalt conforming with requirements of Caltrans Standard Specifications Section 37; Grade: Medium Fine; Asphaltic emulsion Grade SS-1.

D. Water: Potable.

2.5 ACCESSORY MATERIALS

A. Joint Sealant: ASTM D 6690 or AASHTO M 301, hot-applied, single-component, polymer-modified bituminous sealant.

B. Herbicide: Commercial chemical for weed control, registered by the EPA, and not classified as “restricted use” for locations and conditions of application. Provide in granular, liquid, or wettable powder form.

C. Wood Header Boards and Stakes:

1. Species: Redwood.
2. Grade: Construction Heart, as per applicable rules of the RIS for grading and inspection.

2.6 MIXES

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes designed according to Caltrans Standard Specifications Section 39 requirements for Type A asphalt concrete.

1. Provide mixes with a history of satisfactory performance in geographic area where Project is located.
2. Provide mixes complying with the following requirements for maximum aggregate sizes:
   a. Base Lift(s): 3/4-inch maximum size, medium graded.
   b. Surface Lift(s): 3/8-inch maximum size, medium graded.

B. Emulsified-Asphalt Slurry: Slurry mix consisting of emulsified asphalt, fine aggregate, and mineral fillers in conformance with Caltrans Specification Section 37.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.

B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PATCHING

A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade. Excavate as follows, unless indicated otherwise:

1. At utility trenches, excavate continuous patch along path of trench.
2. At areas to be patched, excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement.

B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal/sq yd.

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.

2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

C. Patching: Fill excavated pavement areas with hot-mix asphalt base mix for full thickness of patch, and, while still hot, compact flush with adjacent surface.

3.3 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.

1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.

1. Clean cracks and joints in existing hot-mix asphalt pavement.
2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.
3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

3.4 PREPARATION

A. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.

B. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive base course and paving, and is free of mud, frost, snow, or ice.

C. Header Boards and Stakes: Set header boards true to lines and grades, and as indicated on Drawings.

D. Place and compact aggregate base course to thicknesses required for each section. Comply with requirements of Caltrans Standard Specification Section 26.

1. Placement Layers:
   a. Place base course 6 inches or less in compacted thickness in a single layer.
   b. Place base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
2. Shape base course to required elevations and grades.
3. Compact aggregate base course at optimum moisture content to 95 percent relative compaction according to ASTM D 1557.
4. Proof-roll prepared base course surface to check for unstable areas and verify need for additional compaction. Do not begin paving work until such conditions have been corrected are ready to receive paving.

E. Herbicide Treatment: Apply herbicide according to manufacturer’s recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted aggregate base before applying paving materials. Exercise care to ensure herbicide is not applied to areas not receiving paving.

1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.

F. Tack Coat: Apply uniformly to horizontal surfaces of existing pavement and vertical surfaces of abutting curbs, gutters, construction joints, and existing pavements at a rate of 0.05 to 0.15 gal/sq yd.

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.5 PLACING HOT-MIX ASPHALT

A. General: Place asphalt concrete paving in conformance with requirements of Caltrans Standard Specifications Section 39.

B. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

C. Place hot-mix asphalt paving in maximum lift thicknesses of 3 inches.

D. Spread mix at minimum temperature of 250 deg F (121 deg C), or as otherwise required to maintain required minimum temperatures for breakdown rolling and compaction.

E. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.

F. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

G. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about 1 to 1-1/2 inches from strip to strip to ensure proper compaction of mix along longitudinal joints.
2. Complete a section of asphalt base lift before placing asphalt surface lift.

H. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

I. Conforms between new and existing paving shall form smooth, pond-free transition.

3.6 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
3. Offset transverse joints, in successive courses, a minimum of 24 inches.
4. Construct joints as described in Caltrans Specifications Section 39.
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints a density within 2 percent of specified course density.

3.7 COMPACTION

A. General: Compact hot-mix asphalt concrete paving in conformance with requirements of Caltrans Standard Specifications Section 39.

B. Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.

C. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

1. Complete initial rolling and breakdown compaction before mix temperature cools to minimum level specified in Caltrans Standard Specifications.

D. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough per requirements of Caltrans Specifications Section 39.

1. Complete intermediate and finish compaction before mix temperature cools to minimum levels specified in Caltrans Standard Specifications.

E. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

F. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

G. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

H. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

I. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.8 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Lower Lifts: Plus or minus 1/4 inch.
2. Top (surface) Lift: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Lifts: 1/4 inch.
2. Surface Lift: 1/8 inch.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

C. Speed Bumps: Compact and form asphalt to produce the contour indicated and within a tolerance of plus or minus 1/8 inch of height indicated above pavement surface.

3.9 ASPHALT CURBS

A. Construct hot-mix asphalt curbs over compacted pavement surfaces. Apply a light tack coat unless pavement surface is still tacky and free from dust. Spread mix at a minimum temperature of 250 deg F (121 deg C).

1. Asphalt Mix: Same as pavement surface-course mix.

B. Place hot-mix asphalt to curb cross section indicated or, if not indicated, to local standard shapes, by machine or by hand in wood or metal forms. Tamp hand-placed materials and screed to smooth finish. Remove forms after hot-mix asphalt has cooled.

3.10 ASPHALT SPEED BUMPS

A. Construct hot-mix asphalt speed bumps over compacted pavement surfaces. Apply a tack coat unless pavement surface is still tacky and free from dust. Spread mix at a minimum temperature of 250 deg F.

1. Tack Coat Application: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal/sq yd.
2. Asphalt Mix: Same as pavement surface-course mix.

B. Place and compact hot-mix asphalt to cross section indicated, buy machine or by hand in wood or metal forms. Tamp hand-placed materials and screed to smooth finish. Remove forms after hot-mix asphalt has cooled.

3.11 SURFACE TREATMENTS

A. Fog Seals: Apply fog seal coat in accordance with Caltrans Standard Specification Section 37 to all asphalt concrete paved surfaces.

B. Slurry Seal: Apply slurry coat in a uniform thickness and in accordance with Caltrans Standard Specification Section 37 at existing asphalt paved surfaces indicated.

1. Roll slurry seal to remove ridges and provide a uniform, smooth surface.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.

1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.
2. Additional testing and inspecting, at Contractor’s expense, will be performed to determine compliance of replaced or additional work with specified requirements.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. Asphalt Speed Bumps: Finished height of asphalt speed bumps above pavement will be measured for compliance with tolerances.

E. In-Place Density: Testing Agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979 or AASHTO T 168.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.

2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
    a. One core sample will be taken for every 1000 sq yds or less of installed pavement, with no fewer than three cores taken.
    b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

F. Drainage: After completion of paving work, all asphalt concrete paving shall be flooded with water, and any resulting ponds shall be ringed with chalk. Such areas shall be repaired as required to eliminate ponding by removing and replacing asphalt concrete to correct grades and slopes.

G. Replace and compact hot-mix asphalt where core tests were taken.

H. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.13 WASTE HANDLING

A. Handle asphalt paving waste according to approved waste management plan required by Division 1 Section for construction waste management and disposal.

B. Do not allow excavated materials to accumulate on-site.

END OF SECTION

SECTION 321313- SITE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following site concrete items:
   1. Concrete paving.
      a. Decorative Treatments:
         i) Integral-color pigment.
         ii) Pigmented dry-shake hardener.
         iii) Stained concrete.
         iv) Exposed aggregate.
         v) Stamped concrete.
         vi) Sandblasted concrete.
   2. Concrete curbs and gutters.
   3. Concrete ramps and steps.
   4. Cast-in-place concrete for exposed vertical surfaces.
      a. Decorative Treatments.
         i) Integral color pigment.
         ii) Form liner treatment.
   5. Concrete equipment pads.
   6. Concrete footings for site elements.
   7. Reinforcing for site concrete.
   8. Formwork for site concrete.
   9. Aggregate base course under concrete paving.
   10. Finish treatments for site concrete.
   11. Cast-in skateboard deterrents.

B. Related Sections include:
   1. Section 02 41 19 “Selective Demolition” for sawcutting and removal of existing concrete paving.
   2. Section 03 31 00 “Cast-in-Place Concrete” for structural concrete applications.
   3. Section 31 20 00 “Earthwork” for grading and subgrade preparation for site concrete paving.
   4. Section 32 17 13 “Wheelstops” for precast concrete wheelstops.
   5. Section 32 12 16 “Asphalt Paving” for asphalt paving and base course.
   6. Section 32 17 23 “Pavement Markings” for painted striping and markings on paved surfaces and curbs.
   7. Section 32 17 26 “Tactile Warning Surfaces” for prefabricated tactile warning surface panels cast into freshly poured site concrete paving substrates.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO)

B. American Concrete Institute (ACI)

C. ASTM International (American Society for Testing and Materials)

D. State of California Department of Transportation (Caltrans) Standard Drawings and Specifications

E. Concrete Reinforcing Steel Institute (CRSI)

F. Kern County Standard Drawings

1.4 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

C. Decorative Concrete: Concrete with one of the following decorative treatments:
   1. Integral-color pigment.
   2. Pigmented dry-shake hardener.
   3. Concrete stain.
   4. Exposed aggregate.
   5. Stamped concrete.

1.5 COORDINATION

A. Coordinate placement and finishing of site concrete with installation of tactile warning surface cast-in-place panels as specified in Section 32 17 26 “Tactile Warning Surfaces.”

1.6 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.
   1. Review methods and procedures related to site concrete, including, but not limited to, the following:
      a. Concrete mixture design.
      b. Quality control of concrete materials and site concrete construction practices.
      c. Cold- and hot-weather concreting procedures.
      d. Concrete finishes and finishing.
      e. Joints and joint-filler strips.
      f. Curing procedures.
      g. Concrete protection.
   2. Require representatives of each entity directly concerned with site concrete to attend, including the following:
      a. Contractor’s superintendent.
      b. Independent testing agency responsible for concrete design mixtures.
      c. Ready-mix concrete manufacturer.
      d. Site concrete Installer.

1.7 ACTION SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Concrete Mix Designs: For each site concrete mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments. All mix designs shall be identified by a mix design identification number, and selected by a registered Civil Engineer with experience in concrete mix design. Mix design report shall be sealed and signed by qualified professional engineer responsible for its preparation.

C. Formwork Shop Drawings: Show formwork construction including form liner joints, rustications, construction and control joints, reveals, edge conditions, form joint sealant details, form tie locations and patterns, inserts and embedments, and other items that affect visual appearance of cast-in-place site concrete.

D. Samples for Initial Selection: Submit manufacturer's full range of available colors for selection by Architect, for items requiring color selection.

E. Submit drawing of reinforcing steel, tie bars, and connecting dowels.

F. Samples for Verification:

1. Sample of form liner.
2. Sample of exposed aggregate mix, 5 lbs.
3. Sample of each concrete integral color pigment, on concrete material, 4 inches by 4 inches.
4. Sample of each concrete dry-shake hardener color, on concrete material, 4 inches by 4 inches.
5. Sample of each concrete stain color, on concrete material, 4 inches by 4 inches.

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified ready-mix concrete manufacturer.

B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

1. Aggregates.

C. Material Certificates: From manufacturers, certifying that each of the following materials complies with requirements:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
6. Applied finish materials.
7. Bonding agent or epoxy adhesive.
8. Joint fillers.

D. Concrete Batch Plant Tickets: Load identification tickets for each load of concrete delivered to site. Batch ticket shall bear the following information:
   1. Design mix number.
   2. Signature or initials of concrete plant representative.
   3. Time of batching.
   4. Weight of cement, aggregates, water and admixtures in each batch with maximum aggregate size.
   5. Total volume of concrete in each batch.
   6. Notation indicating equipment was checked for contamination prior to batching.

E. Minutes of preinstallation conference.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer of decorative concrete paving systems.

B. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94 requirements for production facilities and equipment.

C. Concrete Testing Service: Owner will employ and pay for a qualified independent testing and inspection laboratory to perform concrete testing and inspection services during construction.

D. ACI Publications: Comply with ACI 301 unless otherwise indicated.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Store aggregate for exposed applications off the ground and protected from contamination and moisture.

B. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

C. Store form liners in accordance with manufacturer’s written instructions, and to prevent deterioration from moisture, heat, cold, direct sunlight, and other detrimental effects.

1.11 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain decorative concrete products and each type of class of cementitious material of the same brand from same manufacturer’s plant, and obtain each aggregate from a single source.

2.2 CALGREEN REQUIREMENTS

A. General: Conform with all applicable requirements of the California Green Building Standards Code (CALGreen).

2.3 PERFORMANCE REQUIREMENTS

A. Design and fabricate concrete formwork in accordance with ACI 347.

1. Formwork shall be capable of withstanding all loads imposed during construction, including weight of equipment, uncured concrete, and other pressures and loads occurring prior to curing of concrete.

2.4 BASE COURSE

A. Base Course Aggregate: Sound, angular crushed stone, crushed gravel, or crushed slag, stone, or slag screenings. Comply with Caltrans Standard Specification, Section 26 for Class 2 base, 3/4 inch maximum aggregate size and minimum R value of 78.

2.5 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, true, smooth exposed concrete surfaces. Furnish in largest practical sizes to minimize number of joints.

1. Use flexible or curved forms for curves with a radius of 100 feet or less. Do not use notched or bent forms.

B. Form Joint Tape: Compressible, foam tape; pressure sensitive; AAMA 800, “Specification 810.1, Expanded Cellular Glazing Tape”; minimum 1/4 inch thick.

C. Form Joint Sealant: Elastomeric sealant complying with ASTM C 920, Type M or Type S, Grade NS, that adheres to form joint substrates.

D. Chamfer Strips: Metal, rigid plastic, rubber strips, or dressed wood, 3/4 inch by 3/4 inch, unless indicated otherwise; in longest practicable lengths.

E. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that leave no metal closer than 1-1/2 inches to the plane of exposed concrete surface.
2. Furnish ties with tapered tie cone spreaders that, when removed, will leave holes 1 inch in diameter in concrete surface.
3. Wire ties are not acceptable.

F. Form Liner: Units of face design, texture, arrangement, and configuration indicated, and suitable for reuse. Furnish with manufacturer’s recommended liquid-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent surface treatments of concrete. Provide solid backing and form supports to ensure stability of form liners.

G. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.6 STEEL REINFORCEMENT

A. Plain-Steel Welded-Wire Reinforcement: ASTM A 185, fabricated from galvanized-steel wire into flat sheets.

B. Reinforcing Bars: ASTM A 615, Grade 60; deformed.

C. Joint Dowel Bars: ASTM A 615, Grade 60 plain-steel bars. Cut bars true to length with ends square and free of burrs.
   1. Dowel Sleeve: Rigid polypropylene sleeve, 5/8-inch diameter by 9 inches long, with reusable base, designed for attachment to face of concrete form.
      a. Products: Subject to compliance with requirements, provide one of the following:
         i) Speed Dowel.
         ii) Equal product in accordance with Division 1 requirements for product substitutions.

D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:
   1. Equip bar supports with sand plates or horizontal runners where base material will not support chair legs.
   2. Where legs of wire bar supports contact forms, use gray, all-plastic bar supports.

2.7 CONCRETE MATERIALS

A. Cementitious Materials: Use the following cementitious materials, of the same type, brand, and source throughout Project:
   1. Portland Cement: ASTM C 150 gray portland cement, Type II/V.

B. Normal-Weight Aggregates: ASTM C 33, Class 4M coarse aggregate, uniformly graded. Provide aggregates from a single source.
   1. Maximum Coarse-Aggregate Size: 1-1/2 inches, except as noted below.
      a. Maximum Coarse-Aggregate Size for Base Slabs to Receive Seeded Exposed Aggregate Pavement Finishes: 3/4 inch.
      b. Maximum Coarse-Aggregate Size for Slabs to Receive Stamped Concrete Finish: 3/4 inch.
   2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Exposed Aggregate, Seeded: Selected, hard, and durable; washed; free of materials with deleterious reactivity to cement or that cause staining; from a single source; to be approved by Architect and Owner.

D. Water: Potable and complying with ASTM C 94.

E. Air-Entraining Admixture: ASTM C 260.

F. Chemical Admixtures: Where used, provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
   1. Water-Reducing Admixture: ASTM C 494, Type A.
   2. Retarding Admixture: ASTM C 494, Type B.
   3. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
   4. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
   5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.
   6. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.

G. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis.

1. Products: Subject to compliance with requirements, provide one of the following products or product by one of the following manufacturers:
    a. Bomanite Corporation; Integral Color.
    b. Davis Colors.
    c. Scofield, L.M. Company; CHROMIX Admixtures.
    d. Solomon Colors.
    e. Equal product in accordance with Division 1 requirements for product substitutions.
    a. Color: As selected by Architect from manufacturer's full range.For bidding purposes, assume two different colors in equal quantities for each color.

H. Carbon Black: Tinting agent for darkening concrete mix as required to match tint of existing concrete.

2.8 FIBER REINFORCEMENT

A. Synthetic Fiber: Monofilament polypropylene fibers engineered and designed for use in concrete paving, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches long.
    1. Products: Subject to compliance with requirements, provide one of the following:
        a. Euclid Chemical Company; PSI Fiberstrand 100.
        b. FORTA Corporation; Mighty-Mono.
        c. SI Concrete Systems; Fibermesh 150.
        d. GCP Applied Technologies, Inc; Grace Microfiber.
        e. Equal product in accordance with Division 1 requirements for product substitutions.

2.9 CAST-IN ACCESSORIES FOR SITE CONCRETE

A. Safety Tread Nosings for Concrete Steps: Extruded aluminum units, with abrasive filler strips consisting of aluminum oxide, silicon carbide, or a combination of both, in an epoxy-resin binder. Fabricate units in lengths necessary to accurately fit openings or conditions and length as required to terminate 2 inches from ends of steps.
    1. Products: Per plan.
    2. Provide units meeting requirements of California Building Code (Title 24) and Americans with Disabilities Act for the visually impaired.

B. Skateboard Deterrent: Manufacturer's cast-in projection for deterring skateboard activity on concrete surfaces.
    1. Product: Per plan.

2.10 SURFACE COLORING MATERIALS

A. Pigmented Mineral Dry-Shake Hardener: Factory-packaged dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.
    1. Products: Subject to compliance with requirements, provide one of the following:
        a. Bomanite Corporation; Color Hardener.
        b. Scofield, L.M. Company; LITHOCHROME Color Hardener.
        c. Equal product in accordance with Division 1 requirements for product substitutions.

a. Color: For bidding purposes, assume two different colors in equal quantities for each color.

B. Pigmented Powder Release Agent: Factory-packaged, dry combination of surface-conditioning and dispersing agents interground with color pigments that facilitates release of stamp mats. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Bomanite Corporation; Release Agent.
   b. Scofield, L.M. Company; LITHOCHROME Antiquing Release.
   c. Equal product in accordance with Division 1 requirements for product substitutions.

2. Color: As selected by Architect from manufacturer's full range.
   a. For bidding purposes, assume two different colors in equal quantities for each color.

C. Liquid Release Agent: Manufacturer's standard clear, evaporating formulation that facilitates release of stamp mats and texture rollers.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Bomanite Corporation; Liquid Release.
   b. Scofield, L.M. Company; LITHOTEX Liquid Release.
   c. Equal product in accordance with Division 1 requirements for product substitutions.

2.11 STAMPING DEVICES

A. Stamp Mats: Semirigid polyurethane mats with projecting textured and ridged underside capable of imprinting texture and joint patterns on plastic concrete.

1. Manufacturers: Subject to compliance with requirements, provide products as specified by Architect.
   a. Manufacturer of equal products in accordance with Division 1 requirements for product substitutions.

2.12 STAIN MATERIALS

A. Concrete Stain: Penetrating/reactive stain with wetting agents and high-grade, UV-stable metallic salts that react with calcium hydroxide in cured concrete to produce permanent, variegated, or translucent color effects.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Bomanite Corporation; Con-Color.
   b. Scofield, L.M. Company; LITHOCHROME Tintura Stain.
   c. Equal product in accordance with Division 1 requirements for product substitutions.

2. Color: As selected by Architect from manufacturer's full range.
   a. For bidding purposes, assume two different colors in equal quantities for each color.

2.13 CURING AND SEALING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz/sq yd, dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.

1. Products: Subject to compliance with requirements, provide one of the following:
    a. BASF Construction Chemicals, LLC; MasterKure ER50.
    b. Euclid Chemical Company; Eucobar.
    c. Meadows, W.R., Inc.; Sealtight Evapre.
    d. Sika Corporation, Inc.; SikaFilm.
    e. Equal product in accordance with Division 1 requirements for product substitutions.
2. VOC Content: Complies with requirements specified in “CALGreen Requirements” Article.

E. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Products: Subject to compliance with requirements, provide one of the following:
    a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
    b. Dayton Superior Corporation; Clear Resin Cure J11W.
    c. Euclid Chemical Company; Kurez DR VOX.
    d. Meadows, W.R., Inc.; 1100 Clear.
    e. Equal product in accordance with Division 1 requirements for product substitutions.
2. VOC Content: Complies with requirements specified in “CALGreen Requirements” Article.

F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: Nondissipating; ASTM C 309, Type 1, Class B; ASTM C 1315, Type 1, Class A (nonyellowing).

1. Products: Subject to compliance with requirements, provide one of the following:
    a. ChemMasters; Polyseal WB.
    b. Euclid Chemical Company; Super Diamond Clear VOX.
    c. Meadows, W.R., Inc.; Vocomp-25.
    d. Equal product in accordance with Division 1 requirements for product substitutions.
2. VOC Content: Complies with requirements specified in “CALGreen Requirements” Article.

G. Sealer for Decorative Concrete: Clear sealer as recommended in writing by manufacturer of decorative concrete system.

1. VOC Content: Complies with requirements specified in “CALGreen Requirements” Article.

2.14 ACCESSORY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by the EPA, and not classified as “restricted use” for locations and conditions of application. Provide in granular, liquid, or wettable powder form.

B. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, in preformed strips.

C. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

D. Bonding Agent: ASTM C 1059, Type II, non-redispersable, acrylic emulsion or styrene butadiene.

E. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin capable of humid curing and bonding to damp surfaces; of class suitable for application temperature, of grade complying with requirements; Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. BASF Construction Chemicals, LLC; MaserEmaco ADH 1420.
      b. Dayton Superior Corporation; Sure Bond J58.
      c. Meadows, W.R., Inc.; Rezi-Weld 1000.
      d. Equal product in accordance with Division 1 requirements for product substitutions.

F. Chemical Surface Retarder: Water-soluble, liquid-set retarder with color dye, for horizontal concrete surface application, capable of temporarily delaying final hardening of concrete to a depth of 1/8 to 1/4 inch.
   1. Products: Subject to compliance with requirements, provide one of the following
      a. Dayton Superior Corporation; Top-Cast.
      b. Euclid Chemical Company; Concrete Surface Retarder Formula S.
      c. Meadows, W.R., Inc.; TOP-STOP Concrete Surface Retarder.
      d. Sika Corporation; Rugasol-S.
      e. Equal product in accordance with Division 1 requirements for product substitutions.

G. Rock Salt: Sodium chloride crystals, kiln dried, coarse gradation with 100 percent passing 3/8-inch sieve and 85 percent retained on a No. 8 sieve.

H. Sealant: Joint sealant designed for use in horizontal pedestrian traffic bearing joints in exterior concrete construction.
   1. Comply with ASTM C 920 as follows:
      a. Grade: NS or P (suitable for sloping surfaces up to 10 percent).
      b. Use Related to Exposure: T (traffic).
      c. Uses Related to Joint Substrates: M
   2. Products: Subject to compliance with requirements, provide one of the following:
      a. Pecora Corporation; DynaTred.
      b. BASF Construction Chemicals, LLC; MasterSeal SL 2.
      c. Tremco, Inc.; THC-901.

d. Equal product in accordance with Division 1 requirements for product substitutions.

3. Color: Match color of adjacent paving, unless indicated otherwise

2.15 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete as determined by either laboratory trial mixes or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. For decorative concrete treatments, obtain each color, type, and variety of concrete mixture from a single manufacturer with resources to provide concrete of consistent quality in appearance and physical properties.
3. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 days): 3000 psi with minimum 505 lb cementitious material per cubic yard.
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.55.
3. Slump Limit: 4 inches, plus or minus 1 inch.

C. Add air-entraining admixture at manufacturer’s prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: 3 percent plus or minus 1 percent.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

E. Chemical Admixtures: use admixtures according to manufacturer’s written instructions.

1. Use admixtures as required for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

F. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer’s recommended rate, but not less than 1.0 lb/cu yd.

G. Carbon Black: Where pouring concrete adjacent to existing concrete, add carbon black to concrete mixture in amount as required to match tint of existing concrete.

1. Obtain Architect’s approval of mockup panel with tint to match existing concrete, as specified in Quality Assurance Article.

H. Color Pigment: Where indicated, add color pigment to concrete mixture according to manufacturer’s written instructions and to result in hardened concrete color consistent with approved mockup.

2.16 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrade surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
   1. Refer to Section 31 20 00 “Earthwork” for preparation of subgrade.

B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Immediately before placing base course and concrete materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive base course and paving, and is free of mud, frost, snow, or ice.

B. Herbicide Treatment: Apply herbicide according to manufacturer’s recommended rates and written application instructions. Apply to dry prepared subgrade or surface of base course.

C. Protect adjacent construction from discolorations and spillage during application of color hardeners, release agents, stains, curing compounds, and sealers.

3.3 PLACEMENT OF BASE COURSE

A. Place and compact aggregate base course to thicknesses required for each section. Comply with requirements of Caltrans Standard Specification Section 26.
   1. Placement Layers:
      a. Place base course 6 inches or less in compacted thickness in a single layer.
      b. Place base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
   2. Shape base course to required elevations and grades.
   3. Compact aggregate base course at optimum moisture content to 95 percent relative compaction according to ASTM D 1557.
   4. Proof-roll prepared base course surface to check for unstable areas and verify need for additional compaction. Do not begin paving work until such conditions have been corrected are ready to receive paving.

B. Remove loose material from compacted base course surface immediately before placing concrete.

3.4 EDGE FORMS AND SCREED CONSTRUCTION – ON GRADE CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to achieve required elevations and slopes in finished concrete surfaces. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Check completed formwork and screeds for grade and alignment to following tolerances:
   1. Top of Forms: Not more than 1/8 inch in 10 feet.
   2. Vertical Face on Longitudinal Axis: Not more than 1/4 inch in 10 feet.

C. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.

3.5 FORMWORK CONSTRUCTION – EXPOSED VERTICAL CONCRETE SURFACES

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, unit structure can support such loads.

B. Construct formwork so concrete elements are of size, shape, alignment, elevation, and position indicated, straight, and true to line and level, within tolerance limits of ACI 117.

C. Construct forms to result in cast-in-place concrete that complies with ACI 117.

D. Form Ties: Ties shall not leave fractures, spalls, depressions, or other surface disfigurations.

1. Ties shall not leave metal closer than 1-1/2 inches to exposed surface.

E. In addition to ACI 303.1 limits on form panel deflection, limit cast-in-place architectural concrete irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch.

F. Construct forms tight to prevent loss of concrete mortar.

G. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Seal form joints and penetrations at form ties with form joint tape or form joint sealant to prevent cement paste leakage.
2. Do not use rust-stained steel form-facing material.
3. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms, only.

H. Chamfer exposed outside corners and edges where indicated on Drawings, to produce smooth form lines and tight edge joints.

I. Limit deflection of form-facing panels so as not to exceed ACI 303.1 requirements.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer’s written instructions, before placing reinforcement.

M. Coat contact surfaces of forms with surface retarder, according to manufacturer’s written instructions, before placing reinforcement.

N. Place form liners accurately to provide finished surface texture indicated, and as required to achieve the appearance of an uninterrupted pattern across the entire area of concrete receiving form liner finish. Provide solid backing and attach securely to prevent deflection and maintain stability of liners during concreting. Prevent form liners from sagging and stretching in hot weather. Seal joints of form liners and form liner accessories to prevent mortar leaks.

1. Clean form liner panel prior to each use. Do not use damaged form liners.
2. Coat form liner with form-release agent immediately prior to concrete placement, to avoid accumulation of foreign material on surface of form liner.
    a. Protect reinforcing steel from form-release agent.

O. Remove forms without damage to concrete. Comply with ACI 347.

3.6 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

1. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

F. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

3.7 JOINTS

A. General: Form construction, expansion, control, and isolation joints, and tool edges true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than 1/2 hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of paving strips, unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Expansion Joints at Paving: Form expansion joints, sectioning concrete paving into areas as indicated. If not indicated, provide expansion joints at a maximum spacing of 20 feet.

1. Install doweled joint assemblies where indicated, parallel to slab, and perpendicular to joint, using one of the following:
    a. Install dowel sleeve and dowel at slab mid-depth in accordance with manufacturer's written instructions.
    b. Install dowel bars and support assemblies. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
2. Extend fiber expansion joint filler strip full width and depth of joint, with top edge of filler strip 1/2 inch below finished concrete surface.
3. Furnish joint filler in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together.

4. Do not extend reinforcing across expansion joints.
5. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Control Joints at Paving: Form weakened-plane control joints, sectioning concrete paving into areas as indicated. If not indicated, provide control joints at a maximum spacing of 6 feet. Construct control joints to a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4 inch radius. Repeat grooving of control joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.
2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
    a. Where sawed joint terminates at adjoining vertical surface, fully extend sawed joint to edge of paving and vertical surface.

E. Control Joints at Cast-In-Place Vertical Surfaces: Form weakened-plane control joints true to line with faces perpendicular to surface plane of cast-in-place concrete so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

F. Isolation Joints: Form isolation joints of preformed fiber joint filler strips abutting curbs, catch basins, manholes, inlets, structures, walks, or other fixed objects, and where indicated.

1. Extend fiber expansion joint filler strip full width and depth of joint, with top edge of filler strip 1/2 inch below finished concrete surface.
2. Furnish joint filler in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together.
3. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

3.8 CONCRETE PLACEMENT

A. Inspection: Before placing site concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

C. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

D. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

E. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

F. Concrete Paving:

1. Remove snow, ice, or frost from base course surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.
2. Moisten base course to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
3. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
4. Screed paving surfaces with a straightedge and strike off.
    a. Where concrete is being poured adjacent to existing concrete, strike off flush with existing concrete.
5. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
    a. At concrete to receive seeded exposed aggregate finish, finishing of surface elevation to allow for volume growth due to addition of the seeding aggregate, to achieve final elevations.
6. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.

G. Cast-In-Place Vertical Surfaces: Deposit concrete continuously in one layer or in horizontal layers of such thickness not to exceed formwork design pressure, and such that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

H. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:
1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators.

I. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and base course just before placing concrete. Keep base course moisture uniform without standing water, soft spots, or dry areas.

J. Tactile Warning Surfaces: Form blockouts in concrete for installation of tactile warning surface panels specified in Section 32 17 26 "Tactile Warning Surfaces." Screed surface of concrete where panels are to be installed to elevation, so that edges of installed panels will be flush with surrounding concrete paving. Refer to Section 32 17 26 "Tactile Warning Surfaces" for installation of tactile warning surface panels.

K. Skateboard Deterrents: Install skateboard deterrents in accordance with manufacturer's written instructions, at locations indicated and spacings indicated.

3.9 CONCRETE CURBS AND GUTTERS

A. Construct concrete curbs, gutters, and sidewalks in conformance with requirements of Caltrans Standard Specifications Section 73.

B. Steel trowel surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Provide expansion joints at 20 feet on center maximum.

1. Fill expansion joint with joint filler material, shaped to match cross-section of curb, with outer edge of filler material 1/2 inch below finished concrete surface.
2. Where joints occur in adjacent paving, joints in curb to align with joints in paving.

3.10 CONCRETE CURB RAMPS

A. Construct concrete curb ramps in conformance with requirements of United States Justice Department's ADA Standards for Accessible Design, and California Building Code (Title 24, Part 2), current editions.

3.11 CONCRETE STEPS

A. Install cast-in safety tread nosings at front edge of steps in accordance with manufacturer's written instructions and in conformance with requirements of United States Justice Department's ADA Standards for Accessible Design, and California Building Code (Title 24, Part 2), current editions.

3.12 PIGMENTED MINERAL DRY-SHAKE HARDENER

A. Pigmented Mineral Dry-Shake Hardener Finish: After initial floating, apply dry-shake materials to paving surface according to manufacturer's written instructions and as follows:

1. Uniformly spread dry-shake hardener at a rate recommended in writing by manufacturer, and as required to match appearance of approved mockup panel.
2. Uniformly distribute approximately two-thirds of dry-shake hardener over concrete surface with mechanical spreader, allow to absorb moisture, and embed by power floating. Follow power floating with a second application of pigmented mineral dry-shake hardener, uniformly distributing remainder of material at right angles to first application to ensure uniform color, and embed hardener by final power floating.

B. After final power floating, apply finish as specified in "Concrete Paving Finish" Article.

C. At concrete paving to receive stamped finish, apply finish pattern as specified in "Concrete Stamping" Article.

3.13 DECORATIVE CONCRETE STAMPING

A. Mat Stamping: After floating and while concrete is plastic, apply mat-stamped finish in accordance with manufacturer's written instructions.

1. Pigmented Powder Release Agent: Uniformly distribute onto still-plastic concrete at rate recommended in writing by manufacturer.

[or]

2. Liquid Release Agent: Apply liquid release agent to the concrete surface and stamp mat. Uniformly mist surface of concrete at rate recommended in writing by manufacturer.

3. After application of release agent, accurately align and place stamp mats in sequence, as required to achieve the appearance of an uninterrupted pattern across the entire area of stamped concrete.
4. Uniformly load mats and press into concrete to produce required imprint pattern and depth of imprint on concrete surface. Gently remove stamp mats. hand stamp edges and surfaces unable to be imprinted by stamp mats.
5. Remove residual release agent according to manufacturer's written instructions, but not fewer than three days after stamping concrete. High-pressure wash surface and joint patterns, taking care not to damage stamped concrete. Control, collect, and legally dispose of runoff.

3.14 CONCRETE PAVING FINISH

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
   1. Surfaces With a Slope of 6 Percent or Less: Medium textured broom finish.
      a. Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
         i) Static Coefficient of Friction for Wet Surfaces, as tested per ASTM C 1028: 0.60 minimum.
   2. Surfaces With a Slope of Greater Than 6 Percent: Coarse textured broom finish.
      a. Draw a stiff bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, striated texture, 1/16-inch deep.
         i) Static Coefficient of Friction for Wet Surfaces, as tested per ASTM C 1028: 0.80 minimum.
   3. Areas Being Patched Into Existing Concrete: Match finish texture of existing concrete.

C. Final Tooling: Tool edges of paving, gutters, curbs, planters, joints, and other exposed edges formed in fresh concrete with an edging tool to a 1/4-inch radius.. Repeat tooling of edges and joints after applying surface finishes. Eliminate tool marks on concrete surfaces.

D. Safety Grooves:
   1. Form safety grooves at concrete steps as indicated, using a jointer while concrete is still fresh.
   2. Cut uniform grooves to dimensions and spacing as indicated.
   3. Strike grooves before and after brooming.

E. Apply sealant over joint fillers. Do not apply sealant before concrete staining, sandblasting, and sealing operations are complete.
   1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, grease, water, surface dirt, and frost. Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.
      a. Remove laitance and form release agents from concrete.
   2. Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
      a. Place sealants so they directly contact and fully wet joint substrates.

b. Completely fill recesses in each joint configuration.

c. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

3. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

a. Remove excess sealant from surfaces adjacent to joints.

b. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

c. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.15 CAST-IN-PLACE CONCRETE VERTICAL SURFACE FINSHES

A. Exposed Concrete Finish, General: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects with portland cement to match finish of exposed concrete.

B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces.

1. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

2. Final Tooling: Tool edges of curbs, planters, joints, and other exposed edges formed in fresh concrete with an edging tool to a 1/4-inch radius.. Repeat tooling of edges and joints after applying surface finishes. Eliminate tool marks on concrete surfaces.

C. Vertical Surfaces: Except where sandblasting is indicated, at exposed vertical surfaces, provide smooth rubbed finish not later than one day after form removal.

1. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.

[or]

2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part Portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white Portland cement in amounts determined by trial patches so color of dry grout will match surrounding concrete. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

D. Form-Liner Finish: Produce a textured surface free of pockets, streaks, and honeycombs, and of uniform appearance, color, and texture.

3.16 SPECIAL CONCRETE PAVING FINISHES

A. Seeded Exposed-Aggregate Finish:

1. Preparation: Prior to concrete placing, thoroughly wash seeding aggregate so that it is free of all dust, dirt, and clay particles. Aggregate shall be in a damp condition but without free surface water at time of seeding.

2. Chemical Surface Retarder: Apply chemical surface retarder to concrete surfaces. Apply according to manufacturer’s written instructions after placing, screeding and floating.

3. Seeding: Immediately after initial floating, spread a single layer of aggregate uniformly on paving surface. Tamp aggregate evenly into plastic concrete, and float finish to entirely embed aggregate with mortar cover of 1/16 inch.
    a. Spray-apply chemical surface retarder to pavement according to manufacturer's written instructions.
    b. Cover pavement surface with plastic sheeting, sealing laps with tape, and remove sheeting when ready to continue finishing operations.
    c. When concrete is sufficiently hard to allow removal of excess mortar without dislodging aggregate, remove excess mortar by lightly brushing surface with a stiff, nylon-bristle broom. Do not use wire-bristle brooms. Do not expose more than one-third of the average diameter of the aggregate and not more than one-half of the diameter of the smallest aggregate.
    d. Fine-spray surface with water and brush. Repeat water flushing and brushing cycle until cement film is removed from aggregate surfaces to depth required, and flush water runs clear.
4. Curing and Sealing Compound: Apply nonyellowing curing and sealing compound uniformly to floors and slabs indicated in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

B. Slip-Resistive Aggregate Finish: Before final floating, spread slip-resistive aggregate on paving surface according to manufacturer's written instructions and as follows:
1. Uniformly spread at a rate of 25 lb/100 sq ft, dampened slip-resistive aggregate over pavement surface in two applications. Tamp aggregate flush with surface using a steel trowel, but do not force below surface.
2. Uniformly distribute approximately two-thirds of slip-resistive aggregate over paving surface with mechanical spreader, allow to absorb moisture, and embed by power floating. Follow power floating with second slip-resistive aggregate application, uniformly distributing remainder of material at right angles to first application to ensure uniform coverage, and embed by power floating.
3. Cure concrete with curing compound recommended by slip-resistive aggregate manufacturer. Apply curing compound immediately after final finishing.
4. After curing, lightly work surface with a steel-wire brush or abrasive stone and water to expose nonslip aggregate.

C. Rock-Salt Finish: After initial floating, uniformly spread rock salt over paving surface at a rate of 5 lb/100 sq ft.
1. Embed rock salt into plastic concrete with roller or magnesium float.
2. Cover paving surface with 1 mil thick polyethylene sheet and remove sheet when concrete has hardened and seven-day curing period has elapsed.
3. After seven-day curing period, saturate concrete with water and broom-sweep surface to dissolve remaining rock salt, thereby leaving pits and holes.

3.17 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection and ACI 105.1 for hot-weather protection during curing.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq ft per hour before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods for Non-Decorative Concrete: Cure concrete according to ACI 308.1, by moisture curing, moisture-retaining cover curing, curing compound, or a combination of these as follows*:*

1. Moist Curing: Keep surfaces continuously moist for not less than 7 days with the following materials:
    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and end lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

F. Curing Method for Decorative Concrete: Apply curing/sealing compound in accordance with written instructions of manufacturer of decorative concrete system.

3.18 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot long, unleveled straightedge not to exceed 1/4 inch.
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie-bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch.
6. Vertical Alignment of Dowels: 1/4 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
8. Joint Spacing: 3 inches.
9. Control Joint Depth: Plus 1/4 inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

3.19 FINISH TREATMENTS OF CURED CONCRETE

A. Sandblast Finish: Apply sandblast finish at locations indicated and to match appearance of approved mockup panel. Sandblasting to be applied uniformly across entire area indicated to receive each type of sandblast finish. For each type of texture, match appearance of approved mockup panel.

1. Mask off adjacent areas not to receive sandblast finish, as required to protect from overspray of sandblasting.
2. Allow concrete to cure a minimum of 14 days prior to sandblasting.
3. Use abrasive grit of the proper type and gradation to expose aggregate and surrounding matrix surfaces to match appearance of mockup panel as follows:
    a. Light Cut: Approximately 1/16 inch depth.
    b. Medium Cut: Approximately 1/8 to 3/16 inch depth.
4. Blast corners and edges of patterns carefully, using backup boards in order to maintain a uniform corner or edge line.
5. Use same nozzle, nozzle pressure, and blasting technique as used for mockup panel.
6. Maintain control of abrasive grit and concrete dust in area of sandblasting. Clean up and remove all abrasive grit, concrete dust, and debris at end of each day of sandblasting operations.
7. Sealing Compound: Apply nonyellowing sealing compound uniformly to slabs in continuous operation by power spray or roller in accordance with manufacturer's written instructions.

B. Staining: Apply concrete stains in conformance with manufacturer's written instructions, and to match appearance of approved mockup panel.
1. Allow concrete to cure a minimum of 14 days prior to staining.
2. Prepare surfaces according to manufacturer's written instructions and as follows:
    a. Clean concrete thoroughly by scraping, applying solvents or stripping agents, sweeping and pressure washing, or scrubbing with a rotary floor machine and detergents recommended by stain manufacturer. Rinse until water is clear and allow surface to dry.
        i) Do not use acidic solutions to clean surfaces.
    b. Test surfaces with droplets of water. If water beads and does not penetrate surface, or penetrates only in some areas, profile surfaces by method recommended by stain manufacturer. Retest and continue profiling surface until water droplets immediately darken and uniformly penetrate concrete surfaces.
3. Allow paving surface to dry before applying stain. Verify readiness of paving to receive stain according to ASTM D 4263 by tightly taping 18-by-18-inch, 4-mil-thick polyethylene sheet to a representative area of paving surface. Apply stain only if no evidence of moisture has accumulated under sheet after 16 hours.
4. Apply concrete stain in conformance with manufacturer's written instructions, and to match appearance of approved mockup panel. Repeat application of stain as needed obtain color consistent with approved mockup.
5. Rinse until water is clear. Control, collect, and legally dispose of runoff.
6. Sealing Compound: Apply nonyellowing clear sealing compound over stained concrete surfaces in accordance with stain manufacturer's written instructions.

3.20 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
1. Notify Owner's testing agency at least 2 working days prior to date when observation and testing services are needed.

B. Inspections:
1. Steel reinforcement placement.
2. Steel reinforcement welding.

3. Verification of use or required design mixture.
4. Concrete placement, including conveying and depositing.
5. Curing procedures and maintenance of curing temperature.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 will be performed according to the following requirements:
   1. Testing Frequency: Provide at least one composite sample for each 50 cu yds or fraction thereof of each concrete mixture placed each day.
      a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
   2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
   3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
   5. Compression Test Specimens: ASTM C 31; cast and laboratory-cure one set of three standard cylinder specimens for each composite sample.
   6. Compressive-Strength Tests: ASTM C 39; one specimen to be tested at 7 days and two specimens at 28 days.
      a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

D. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

E. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

F. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

G. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

H. Remove and replace site concrete that test reports and inspections indicate do not comply with specified requirements.

I. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

J. Concrete Batch Plant Tickets.: Submit to Project Inspector, load identification tickets for each load of concrete delivered to site. Refer to Part 1 "Submittals" Article for required information for batch tickets.

3.21 REPAIRS AND PROTECTION

A. Remove and replace site concrete that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive. Filled areas to match surrounding concrete in surface treatment and color.

C. Remove base rock and concrete spillage from all planting areas.

D. Clean exposed site concrete surfaces carefully. Brushing and cleaning, if used, to be preceded and followed with a thorough rinsing of clear water. Sandblasting not allowed for cleaning purposes.

E. Detailing of Stamped Concrete: Grind concrete “squeeze” left from tool placement. Color ground areas with slurry of color hardener mixed with water and bonding agent. Remove excess release agent with high-velocity blower.

F. Protect concrete from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

G. Maintain site concrete free of stains, discoloration, dirt, and other foreign material. Sweep concrete paving not more than 2 days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 13 13

SECTION 331116- SITE WATER DISTRIBUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes site distribution piping outside buildings for water service, and the following components:
   1. Valves.
   2. Backflow preventers.
   3. Concrete thrust blocks.

B. Contractor shall coordinate the following items with utility company:
   1. Connection to water main in street and underground piping to water meters.
   2. Installation of water meters and accompanying utility boxes.

C. Related Sections include:
   1. Section 31 30 00 “Earthwork” for trenching and backfilling for underground water lines, and detectable warning tapes.
   2. Section 31 23 16 “Utility Trenching” for trenching and backfilling for underground water lines, and detectable warning tapes.
   3. Division 32 Section “Irrigation” for irrigation lines.

1.3 DEFINITIONS

A. Water Main: Utility’s water piping.

B. Water Service: Site domestic water piping.

C. Point of Delivery: Piping outlet from water meter.

D. DN: Dimension Nominal.

E. NPS: Nominal Pipe Size.

F. PVC: Polyvinyl chloride plastic.

1.4 SUBMITTALS

A. Product Data: For each type of product, including the following:
   1. Piping and related specialties.
   2. Valves and accessories.
   3. Valve boxes.
   4. Backflow preventers and accessories.

B. Shop Drawings: For the following:
   1. Precast concrete utility boxes, including frames and covers.

2. Protective enclosure for backflow preventer.

C. Coordination Drawings: For piping and specialties including relationship to other services in same area. Show piping and specialty sizes and valves, meter and specialty locations, and elevations.

D. Field Quality-Control Test Reports: From Contractor.

E. Operation and Maintenance Data: For specialties to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Sections for closeout procedures and operation and maintenance data, include the following:

1. Valves.
2. Backflow preventers.
3. Protective enclosures.

F. Record drawings of installed water service lines and appurtenances in accordance Division 1 Section for project closeout requirements.

1. Locate and dimension work with reference to permanent landmarks. Indicate materials and sizes of all components.

1.5 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, and dimensional requirements of piping and specialties and are based on the specific system indicated. Refer to Division 1 Section for product requirements.

B. Regulatory Requirements:

1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
2. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.

C. Piping materials shall bear label, stamp, or other markings of specified testing agency.

D. NSF Compliance:

1. Comply with NSF 14 for plastic potable-water-service piping.
2. Comply with NSF 61 for materials for water-service piping and specialties for domestic water.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Preparation for Transport: Prepare valves according to the following:

1. Ensure that valves are dry and internally protected against rust and corrosion.
2. Protect valves against damage to threaded ends and flange faces.
3. Set valves in best position for handling. Set valves closed to prevent rattling.

B. During Storage: Use precautions for valves, according to the following:

1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off ground or pavement in watertight enclosures when outdoor storage is necessary.

C. Handling: Use sling to handle valves if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.

F. Protect flanges, fittings, and specialties from moisture and dirt.

G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.7 PROJECT CONDITIONS

A. Do not interrupt existing 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 Owner and utility company not less than five working days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's and utility company's written permission.

B. Information shown regarding locations of existing utilities is based upon available records and data, but shall be regarded as approximate, only. Make minor deviations necessary to conform with actual locations and conditions without extra cost. Verify location and elevation of utilities prior to commencement of excavation.

1. Exercise extreme care in excavating near existing utilities. Contractor is responsible for damage to existing utilities.

1.8 COORDINATION

A. Coordinate connection to water main and meter with utility company.

B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

C. Coordinate placement of valve boxes with layout of paving joints and patterns. Refer to Drawings for layout.

PART 2 - PRODUCTS

2.1 PIPING MATERIAL

A. Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.

2.2 DUCTILE IRON PIPE AND FITTINGS

A. Mechanical Joint, Ductile Iron Pipe: AWWA C151, with mechanical joint, bell joint and plain spigot end unless grooved or flanged ends are indicated.

1. Mechanical Joint, Ductile Iron Fittings: AWWA C110, ductile iron or gray iron standard pattern or AWWA C153, ductile iron compact pattern.

a. Glands, Gaskets, and Bolts: AWWA C111, ductile iron or gray iron glands, rubber gaskets, and steel bolts.

2.3 PVC PIPE AND FITTINGS

A. PVC (Iron Pipe Size (IPS)): water pipe 3” and smaller shall conform to ASTM D1785 Schedule 40 and shall have solvent welded joints. Pipe shall be installed in conformance with manufacturer’s recommendations.

1. PVC Molded Fittings: ASTM D 2466.

a. Solvent cement for sizes smaller than 4”.

B. PVC (Cast Iron Pipe Size (CIPS)): AWWA C900, Class 150, with bell end with gasket and spigot end for water pipe greater than 3”; gaskets meeting requirements of ASTM F 477.

1. PVC Molded Fittings: AWWA C907, Class 150, with bell and spigot or double bell ends. Include elastomeric gasket in each bell.

2.4 JOINING MATERIALS

A. AWWA Transition Couplings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Cascade Waterworks Manufacturing Company.

b. Dresser Industries, Inc.; DMD Division.

c. JCM Industries.

d. Viking Johnson.

e. Manufacturer of equal products in accordance with Division 1 requirements for product substitutions.

2. Underground Piping, NPS 1-1/2 (DN 40) and Smaller: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

3. Underground Piping, NPS 2 (DN 50) and Larger: AWWA C219, metal, sleeve-type coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

B. Plastic-to-Metal Transition Fittings: PVC one-piece fitting with manufacturer’s Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-joint end.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Eslon Thermoplastics.

b. Manufacturer of equal products in accordance with Division 1 requirements for product substitutions.

C. Plastic-to-Metal Transition Unions: MSS SP-107, PVC four-part union. Include brass end, solvent cement joint end, rubber O-ring, and union nut.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. NIBCO Inc.

b. Manufacturer of equal products in accordance with Division 1 requirements for product substitutions.

D. Pipe Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
   1. AWWA C110, rubber, flat face, 1/8-inch thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.

E. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

F. Plastic Pipe Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

G. Solvent Cements for Joining Plastic Piping:
   1. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

2.5 SLEEVES

A. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.

2.6 GATE VALVES

A. Bronze Gate Valves:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Crane Co.; Crane Valve Group; Stockham Division
      b. NIBCO INC.
      c. Manufacturer of equal products in accordance with Division 1 requirements for product substitutions.
   2. Non-rising Stem Gate Valves:
      a. Description: Class 125, Type 1, bronze with solid wedge, threaded ends, and malleable-iron handwheel.
         i) Standard: MSS SP-80.

2.7 VALVE ACCESSORIES AND SPECIALTIES

A. Tapping Sleeve Assemblies: Comply with MSS SP-60. Include sleeve and valve compatible with drilling machine.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. American Cast Iron Pipe Company; Waterous Company Subsidiary.
      b. Grinnell Corporation; Mueller Company; Water Products Division
      c. United States Pipe and Foundry Company.
      d. Manufacturer of equal products in accordance with Division 1 requirements for product substitutions.
   2. Tapping Sleeve: Cast iron or ductile iron or stainless steel, two-piece bolted sleeve with flanged outlet for new branch connection. Include sleeve matching size and type of pipe material being tapped and with recessed flange for branch valve.
   3. Valve: AWWA, cast-iron, non-rising-stem, metal seated gate valve with one raised face flange mating tapping-sleeve flange.

B. Non-Traffic Rated Valve Boxes: Valve box and cover per plan.
   1. Provide threaded fasteners to secure lid to box.
   2. Lid to be inscribed with the word “WATER.”

C. Traffic-Rated Valve Boxes: Valve box and cover per plan.
   1. Provide threaded fasteners to secure lid to box.
   2. Lid to be inscribed with the word “WATER.”

2.8 WATER METERS

A. Water meters will be furnished and installed by utility company.

2.9 BACKFLOW PREVENTERS

A. Manufacturer:
   1. As specified on plans.

B. General: AWWA standard, backflow preventers; as approved for use by local water utility.
   1. Working Pressure: 150 psig minimum, unless otherwise indicated.
   2. NPS 2 (DN 50) and Smaller: Bronze body with threaded ends.
   3. NPS 2-1/2 (DN 65) and Larger: Bronze, cast iron, steel, or stainless steel body with flanged ends.
      a. Interior Lining: AWWA C550 or FDA-approved, epoxy coating for backflow preventers having cast Iron or steel body.
   4. Interior Components: Corrosion-resistant materials.
   5. Strainer: On inlet, if indicated.

C. Reduced Pressure Principle Backflow Preventers: AWWA C511, suitable for continuous pressure application. Include outside screw and yoke gate valves on inlet and outlet, and strainer on inlet; test cocks; and pressure differential relief valve with ASME A112.1.2, air-gap fitting located between two positive seating check valves.
   1. Maximum Pressure Loss: 12 psig through middle 1/3 of flow range.

2.10 PROTECTIVE ENCLOSURES

A. Protective Enclosure, General: Outdoor, corrosion-resistant enclosure designed to protect above-ground backflow preventers or other water piping specialties from vandalism. Provide size and dimensions indicated, but not less than those required for access to and service of protected unit.
   1. Manufacturer: Subject to compliance with requirements, provide products by one of the following:
      a. LeMeur Welding & Manufacturing.
      b. Manufacturer of equal products in accordance with Division 1 requirements for product substitutions.
   2. Construction: Galvanized, steel-framed wire-mesh enclosure with padlock hasp for access cover.
   3. Finish: Manufacturer’s standard acrylic enamel factory-applied paint finish.

2.11 MISCELLANEOUS MATERIALS

A. Portland Cement Concrete: Minimum compressive strength of 3000 psi, minimum of four sacks of cement per cubic yard of concrete, one-Inch maximum aggregate size, three-inch maximum slump, two to four percent entrained air.
   1. Cement: ASTM C 150, Type I.
   2. Fine Aggregate: ASTM C 33, sand.

3. Coarse Aggregate: ASTM C33, crushed gravel.
4. Water: Potable.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Refer to Section 31 20 00 “Earthwork” and Section 31 23 16 “Utility Trenching” for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.

B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.

C. Do not use flanges, unions, or keyed couplings for underground piping.

D. Flanges, unions, keyed couplings, and special fittings may be used, instead of joints indicated, on piping in utility boxes and vaults.

E. Underground Water Service Piping: Use the following piping materials for each size range:
1. NPS 3/4 to NPS 1-1/2 (DN 20 to DN 40): PVC (IPS); PVC socket fittings and solvent-cemented joints.
2. NPS 2 to NPS 3 (DN 50 to DN 80): PVC (IPS); PVC gasketed fittings
3. NPS 4 and Larger: PVC, AWWA Class 150 pipe; PVC, AWWA Class 150 molded fittings; and gasketed joints.

F. Aboveground Water Service Piping: Ductile iron pipe with grooved ends; ductile iron, grooved end fittings; ductile iron keyed couplings; and grooved joints.

3.3 VALVE APPLICATIONS

A. General Application: Use threaded or flanged end valves for underground installation, as suitable for piping in which valve is installed. Install AWWA, cast-iron, nonrising-stem, resilient-seated gate valves with valve box.

3.4 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of water-service piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

B. Water-Main Connection: Arrange with utility company for tap of size and in location indicated in water main.

C. Install ductile iron, water-service piping according to AWWA C600 and AWWA C105.

D. Install PVC pipe according to AWWA M23 and ASTM F 645.

E. Select system components with pressure rating equal to or greater than system operating pressure.

F. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

G. Install piping to permit valve servicing.

H. Install water service piping free of sags and bends.

I. Install fittings for changes in direction and branch connections.

J. Install sleeves for pipes passing through concrete and masonry walls and foundations.

K. Unless indicated otherwise, bury piping with depth of cover over top at least 30 inches, with top at least 12 inches below level of maximum frost penetration, and according to the following:

1. Under Driveways and Other Vehicular Traffic Areas: With at least 36 inches cover over top.
2. In Loose Gravelly Soil and Rock: With at least 12 inches additional cover.

L. Install piping by tunneling, jacking, or combination of both, under streets and other obstructions that cannot be disturbed.

M. Restrained Joints: Install underground gasketed-joint water service piping with restrained joints at horizontal and vertical changes in direction. Use concrete thrust blocks or, if indicated, other supports including restrained-joint piping, anchors, and tie rods and clamps.

1. Install concrete thrust blocks at all pipe tees, wyes, bends, crosses, elbows, and risers.
2. Thrust blocks to bear against undisturbed soil, and sized as indicated.
3. Place thrust blocks so that pipe joints are accessible for inspection and repair.

N. Install water-supply piping with shutoff valve in water supply to each building. Use gate valve and valve box.

3.5 JOINT CONSTRUCTION

A. Make pipe joints according to the following:

1. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.
2. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to ASTM D 2774 or ASTM D 3139 and pipe manufacturer’s written instructions.
3. PVC Piping Solvent-Cement Joints: Ream ends of pipe and remove burrs. Clean and dry joining surfaces. Join pipe and fittings according to ASTM D 2672.
   a. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
4. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, with OD, and with system working pressure.

3.6 VALVE INSTALLATION

A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.

B. Center valve box on valve, setting plumb and level.

1. Install valve box extensions as required to extend down to level of piping
2. Compact soil backfill around valve box to a distance of 4 feet on all sides.

3.7 BACKFLOW PREVENTER INSTALLATION

A. Install backflow preventers of type, size, and capacity indicated. Include valves and test cocks. Install according to requirements of utility company, plumbing and health departments, and authorities having jurisdiction.

B. Install backflow preventer to facilitate service, maintenance, and repair or replacement of components.

C. Do not install backflow preventers with relief drain in area subject to flooding.

D. Support NPS 2-1/2 (DN 65) and larger backflow preventers, valves, and piping near floor and on concrete piers.

3.8 CONNECTIONS

A. Connect water service piping at water supply source and extend to point of connection shown on plans.

1. Terminate water service piping at locations shown on plans. Terminate piping with caps, plugs, or flanges as required for piping material. Make final connections to apputanances water piping systems when those systems are installed.

B. Connections to Valves and Equipment: Except as otherwise indicated, make piping connections as follows:

1. Install unions adjacent to each valve and at final connection to each piece of equipment having threaded pipe connection.
2. Install flanges adjacent to each valve and at final connection to each piece of equipment having flanged pipe connection.

3.9 IDENTIFICATION

A. Refer to Section 31 20 00 “Earthwork” and Section 31 23 16 “Utility Trenching” for continuous underground warning tape installed over underground water-distribution piping.

3.10 PROTECTIVE ENCLOSURE INSTALLATION

A. Install concrete slab base level and with top approximately two inches above grade.

B. Install protective enclosure over valves and equipment.

C. Anchor protective enclosure to concrete base.

3.11 FIELD QUALITY CONTROL

A. Piping Tests: Conduct piping tests before joints are covered and after thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.

B. Hydrostatic Tests: Test at not less than 1-1/2 times working pressure for two hours.

1. Increase pressure in 50-psig (350-kPa) increments and inspect each joint between increments. Hold at test pressure for one hour; decrease to 0 psig (0 kPa). Slowly increase again to test pressure and hold for one more hour.

a. Maximum allowable leakage in gallons per hour shall be in accordance with AWWA C605, as determined by the following formula:

$$L = \frac{N \times D \times \text{sq. root of } P}{}$$

7,400

Where: L = allowable leakage in gallons per hour
N = number of joints in length of pipe tested, in feet
D = nominal (rated) diameter of the pipe, in inches.
P = average test pressure during leakage test, in psig

b. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.

C. Prepare reports of testing activities.

3.12 CLEANING

A. Clean and disinfect water distribution piping as follows:

1. Purge new water distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or as described below:
   a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.
   b. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
   c. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.

B. Prepare reports of purging and disinfecting activities.

END OF SECTION

SECTION 333313- SITE SANITARY SEWERAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes gravity-flow, non-pressure sanitary sewerage outside buildings, including the following components:
   1. Cleanouts.

B. Related Sections include:
   1. Division 22 Section for sanitary sewer lines within and below buildings.
   2. Section 31 20 00 “Earthwork” for trenching and backfilling for underground sanitary sewer lines, and detectable warning tapes.
   3. Section 31 23 16 “Utility Trenching” for trenching and backfilling for underground storm drain lines, and detectable warning tapes.
   4. Section 33 41 00 “Site Storm Drainage” for underground storm drain lines outside buildings.

1.3 DEFINITIONS

A. DN: Dimension Nominal.

B. NPS: Nominal Pipe Size.

C. PVC: Polyvinyl chloride plastic.

D. SDR: Standard Dimension Ratio, derived by dividing the outside diameter of the pipe by the pipe wall thickness.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated, including the following:
   1. Piping and related specialties.
   2. Cleanouts.

B. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from sewerage system piping. Indicate interface and spatial relationship between manholes, cleanouts, piping, and proximate structures.

C. Field quality-control test reports.

D. Record drawings of installed sanitary sewerage lines and appurtenances in accordance Division 1 Section for project closeout requirements.
   1. Locate and dimension work with reference to permanent landmarks. Indicate materials and sizes of all components.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

B. Do not store plastic pipe and fittings in direct sunlight.

C. Protect pipe, pipe fittings, and seals from dirt and damage.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Sanitary Sewerage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Architect and Owner no fewer than seven days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Architect's and Owner's written permission.

B. Information shown regarding locations of existing utilities is based upon available records and data, but shall be regarded as approximate, only. Make minor deviations necessary to conform with actual locations and conditions without extra cost. Verify location and elevation of utilities prior to commencement of excavation.

1. Exercise extreme care in excavating near existing utilities. Contractor is responsible for damage to existing utilities.

1.7 COORDINATION

A. Coordinate placement of cleanouts with layout of pavement joints and patterns. Refer to Drawings for layout.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.

2.2 PVC PIPE AND FITTINGS

A. PVC Sewer Pipe and Fittings: NPS 15 (DN 375) and Smaller: ASTM D 3034, SDR 35, with bell-and-spigot ends for gasketed joints with ASTM F 477, elastomeric seals.

2.3 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 888 or CISPI 301.

2.4 CLEANOUTS

A. Cleanout at Grade: County Standard per plan.

B. Cleanout Boxes: cast-iron lid with lifting hole and threaded fasteners to secure lid to box.

1. Cleanout frame and cover per plan.
2. Lid inscribed with the words "SANITARY SEWER."

PART 3 - EXECUTION

3.1 EARTHWORK

A. Refer to Section 31 20 00 “Earthwork” and Section 31 23 16 “Utility Trenching” for excavating, trenching, and backfilling.

3.2 PREPARATION

A. Where connecting to existing sewer lines, verify existing line is free-draining prior to making connection. If required, clean existing line to achieve free-draining condition.

B. Contractor shall coordinate connection to existing with utility company:

1. Connection to sewer main in street shall be performed under County Encroachment Permit.

3.3 PIPING APPLICATIONS

A. Gravity-Flow, Nonpressure Sewer Piping: Use the following pipe materials:

1. NPS 3 (DN 80) to NPS 12 (DN 300): PVC sewer pipe and fittings, gaskets, and gasketed joints.

3.4 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewerage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer’s written instructions.

B. Install piping at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer’s written instructions for use of lubricants, cements, and other installation requirements.

C. Install piping free of sags and bends.

D. Use fittings for changes in direction and branch connections unless indicated otherwise.

E. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

F. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed by tunneling, jacking, or a combination of both.

G. Install gravity-flow, nonpressure drainage piping according to the following:

1. Install piping pitched down in direction of flow, at slope indicated, but in no case less than 1 percent.
2. Install piping at elevations and inverts indicated, but in no case with less than 36-inch cover.
3. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.

H. Clear interior of piping of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

3.5 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure drainage piping according to the following:
   1. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric gasket joints.
   2. Join dissimilar pipe materials with pressure-type couplings.

3.6 CLEANOUT INSTALLATION

A. Install cleanouts and riser extension from sanitary sewerage pipe to cleanout at grade. Use cast-iron soil pipe fittings in sanitary sewerage pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

B. Set cleanout frames and covers in earth in cast-in-place concrete block, as detailed on Drawings. Set with top of concrete flush with adjacent paving material, or, if occurring in planted or soil area, 1-inch above surrounding finish grade.

3.7 CONNECTIONS

A. Connect non-pressure, gravity-flow sanitary sewerage piping to building sanitary sewer lines, as indicated on Drawings.
   1. Refer to Division 15 Section for plumbing sanitary sewer lines occurring inside and below buildings.

B. Make connections to existing sanitary sewer piping.
   1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus six-inch overlap, with not less than six inches of concrete with 28-day compressive strength of 3000 psi.
   2. Protect existing piping to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

3.8 IDENTIFICATION

A. Refer to Section 31 20 00 “Earthwork” and Section 31 23 16 “Utility Trenching” for continuous underground warning tape installed over underground sanitary sewer piping.

3.9 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
   1. Submit separate report for each system inspection.
   2. Defects requiring correction include the following:
      a. Alignment: Less than full diameter of inside of pipe is visible between structures.
      b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
      c. Crushed, broken, cracked, or otherwise damaged piping.
      d. Infiltration: Water leakage into piping.
      e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Re-inspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to Kern County Development Standards.
3. Schedule tests and inspections by authorities having jurisdiction with at least one working day's advance notice.
4. Submit separate report for each test.

C. Leaks constitute defects that must be repaired.

D. Replace leaking piping using new materials.

3.10 CLEANING

A. Clean interior of piping of dirt and superfluous materials. Flush with potable water.

B. Where connecting to existing sewer lines, clean existing line from point-of-connection to nearest downstream manhole or catch basin.

END OF SECTION 333313

SECTION 334000- SITE STORM DRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes gravity-flow, nonpressure storm drain piping outside the building, and the following components:
   1. Cleanouts.
   2. Drains.
   3. Splash blocks.

B. Related Sections include:
   1. Section 31 20 00 “Earthwork” for trenching and backfilling for underground storm drain lines, and detectable warning tapes.
   2. Section 31 23 16 “Utility Trenching” for trenching and backfilling for underground storm drain lines, and detectable warning tapes.
   3. Section 33 33 13 “Site Sanitary Sewerage” for underground sanitary sewer lines outside buildings.

1.3 DEFINITIONS

A. DN: Dimension Nominal.

B. NPS: Nominal Pipe Size.

C. PVC: Polyvinyl chloride plastic.

D. SDR: Standard Dimension Ratio, derived by dividing the outside diameter of the pipe by the pipe wall thickness.

1.4 SUBMITTALS

A. Product Data: For the following:
   1. Piping and related specialties.
   2. Manholes, catch basins, and drains, including frames, covers, and grates.
   3. Cleanouts.

B. Shop Drawings: For the following:
   1. Drains and Inlets: Include plans, elevations, sections, details, and frames, covers, and grates.

C. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from storm drainage system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.

D. Field quality-control test reports.

E. Record drawings of installed storm drainage lines and appurtenances in accordance Division 1 Section for project closeout requirements.

1. Locate and dimension work with reference to permanent landmarks. Indicate materials and sizes of all components.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Do not store plastic manholes, pipe, and fittings in direct sunlight.

D. Handle catch basins and stormwater inlets according to manufacturer's written rigging instructions.

1.6 PROJECT CONDITIONS

A. Information shown regarding locations of existing utilities is based upon available records and data, but shall be regarded as approximate, only. Make minor deviations necessary to conform with actual locations and conditions without extra cost. Verify location and elevation of utilities prior to commencement of excavation.

1. Exercise extreme care in excavating near existing utilities. Contractor is responsible for damage to existing utilities.

1.7 COORDINATION

A. Coordinate placement of cleanouts with layout of pavement joints and patterns. Refer to Drawings for layout.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.

2.2 PVC PIPE AND FITTINGS

A. PVC Sewer Pipe and Fittings, NPS 15 (DN 375) and Smaller: ASTM D 3034, SDR 35, with bell-and-spigot ends for gasketed joints with ASTM F477, elastomeric seals.

2.3 HUBLESS CAST IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A 888 or CISPI 301.

2.4 CLEANOUTS

A. Cleanout at Grade: Cast-iron ferrule with gas- and watertight tapered thread plug.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Zurn Industries, Inc.; #Z-1440.

b. Equal product in accordance with Division 1 requirements for product substitutions.

B. Cleanout Boxes: cast-iron lid with lifting hole and threaded fasteners to secure lid to box.

1. Cleanout frame and cover per plan.

2. Lid inscribed with the words “STORM.”

2.5 AREA DRAINS

A. Area Drain - Type 1: Precast reinforced concrete square drain box with cast-in galvanized steel frame for grate; galvanized welded steel bar grate with hold-down bolts.
   1. Products: Subject to compliance with requirements, provide the following:
      a. Christy Concrete Products, Inc.; V12 Drain Box.
      b. Equal product in accordance with Division 1 requirements for product substitutions.
   2. Dimensions: 12 inches by 12 inches clear inside box; 15 inches by 15 inches ADA grate.
   3. Designed for H20-44 wheel loading requirements according to AASHTO.
   4. Precast Concrete Extension Sections: 12 inches high.
   5. Joint Sealants: ASTM C 990, bitumen or butyl rubber.

B. Area Drain - Type 2: Precast reinforced concrete circular drain box with etched polyethylene face and tapered shoulder at top, to prevent settling; cast iron grate with hold-down bolts.
   1. Products: Subject to compliance with requirements, provide the following:
      a. Christy Concrete Products, Inc.; U21 Drain Box.
      b. Equal product in accordance with Division 1 requirements for product substitutions.
   2. Dimensions: 24 inches by 24 inches clear inside box; ADA grate per manufacturer.
   3. Designed for H20-44 wheel loading requirements according to AASHTO.
   4. Precast Concrete Extension Sections: Standard grade rings 6 inches high.
   5. Joint Sealants: ASTM C 990, bitumen or butyl rubber.

2.6 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
   1. Cement: ASTM C 150, Type II.
   2. Fine Aggregate: ASTM C 33, sand.
   3. Coarse Aggregate: ASTM C 33, crushed gravel.
   4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious materials ratio.

C. Reinforcement:
   1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
   2. Reinforcement Bars: ASTM A 615, Grade 60, deformed steel.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Refer to Section 31 20 00 “Earthwork” and Section 31 23 16 “Utility Trenching” for excavating, trenching, and backfilling.

3.2 PREPARATION

A. Where connecting to existing drain lines, verify existing line is free-draining prior to making connection. If required, clean existing line to achieve free-draining condition.

3.3 PIPING APPLICATIONS

A. Pipe couplings and special pipe fittings with pressure ratings at least equal to piping rating may be used, unless otherwise indicated.

B. Gravity-Flow, Nonpressure Sewer Piping: Use the following pipe materials:

1. NPS 4 to NPS 15 (DN 100 to DN 375): PVC sewer pipe and fittings, gaskets, and gasketed joints.

3.4 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install piping free of sags and bends.

D. Use fittings for changes in direction and branch connections unless indicated otherwise.

E. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

F. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed by tunneling, jacking, or a combination of both.

G. Install gravity-flow, nonpressure drainage piping according to the following:

1. Install piping pitched down in direction of flow, at slope indicated, but in no case less than one percent.
2. Install piping at elevations and inverts indicated, but in no case with less than 36-inch cover.
3. Install PVC storm drain piping according to ASTM D 2321 and ASTM F 1668.

H. Clear interior of piping of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

3.5 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure drainage piping according to the following:

1. Join PVC storm drainage piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric gasket joints.
2. Join dissimilar pipe materials with pressure-type couplings.

3.6 CLEANOUT INSTALLATION

A. Install cleanouts and riser extension from storm drain pipe to cleanout at grade. Use cast iron soil pipe fittings in storm drain pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in storm drain pipe.

B. Set cleanout frames and covers in earth in cast-in-place concrete block, as detailed on Drawings. Set with top of concrete flush with adjacent paving material, or, if occurring in planted or soil area, 1-inch above surrounding finish grade.

3.7 AREA DRAIN INSTALLATION

A. Install area drains in locations indicated.

B. Set drain box in concrete base as indicated.

C. Set drain frames and covers with tops flush with pavement surface.

D. Fasten grates to drains.

E. Install per manufacturer's recommendations.

3.8 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318/318R.

3.9 CONNECTIONS

A. Make connections to existing storm drainage piping.

1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
2. Protect existing piping to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

3.10 IDENTIFICATION

A. Refer to Section 31 20 00 “Earthwork” and Section 31 23 16 “Utility Trenching” for continuous underground warning tape installed over underground storm drainage piping.

3.11 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.
2. Defects requiring correction include the following:
    a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    c. Crushed, broken, cracked, or otherwise damaged piping.
    d. Infiltration: Water leakage into piping.
    e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Re-inspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to Kern County Development Standards.
3. Schedule tests and inspections by authorities having jurisdiction with at least two working days advance notice.
4. Submit separate report for each test.

C. Leaks constitute defects that must be repaired.

D. Replace leaking piping using new materials.

3.12 CLEANING

A. Clean interior of piping of dirt and superfluous materials. Flush with potable water.

B. Where connecting to existing drain lines, clean existing line from point-of-connection to nearest downstream manhole or catch basin.

END OF SECTION