SPECIFICATIONS
Hohbach-Lewin Inc. Project No. 18762

SPORTS FIELD IMPROVEMENTS
TENAYA MIDDLE SCHOOL

MERCED CITY SCHOOL DISTRICT
Merced County, California

HOHBACH-LEWIN, INC.
STRUCTURAL & CIVIL ENGINEERS

909 Montgomery Street, Suite 260
San Francisco, CA 94133
(415) 318-8520

HOHBACH-LEWIN, INC.
STRUCTURAL & CIVIL ENGINEERS

909 Montgomery Street, Suite 260
San Francisco, CA 94133
(415) 318-8520

SPECIFICATIONS
Hohbach-Lewin Inc. Project No. 18762

DSA File No. 24-35
DSA Application No. 02-123490

TENAYA MIDDLE SCHOOL
SPORTS FIELD IMPROVEMENTS

MERCED CITY SCHOOL DISTRICT
Merced County, California

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP: 02-123490 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 04/30/2026

Division of the State Architect

REGISTERED PROFESSIONAL ENGINEER
JEFFREY H. ANSLEY
Lic. No. 19459
Exp: 06/30/2027
Electrical Engineer
STATE OF CALIFORNIA

Jeff Ansley, Electrical Engineer of Record
Pearce Services

REGISTERED PROFESSIONAL ENGINEER
KEVIN G. MORTON
S 5181
STRUCTURAL
STATE OF CALIFORNIA

Kevin Morton, Engineer of Record

ONE TEAM
Merced City School District
One Community

TABLE OF CONTENTS FOR TECHNICAL SECTIONS

SECTION NO.	SECTION TITLE
	BID SPECIFICATIONS
021000	SITE PREPARATION & PLANT PROTECTION
024000	DEMOLITION
027900	BASEBALL FIELD SURFACING
028100	IRRIGATION
028700	SITE FURNISHINGS
029110	LANDSCAPE SOIL PREPARATION
029340	PLANTING
029350	LANDSCAPE MAINTENANCE
032000	CONCRETE REINFORCEMENT
033000	CAST IN PLACE CONCRETE
087100	GATE HARDWARE
116710	OUTDOOR ADULT FITNESS EQUIPMENT
129300	TRACK SITE FURNISHINGS
260000	GENERAL ELECTRICAL REQUIREMENTS
260519	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
260526	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
260533	RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
260533.13	SURFACE RACEWAY
260533.33	OUTDOOR GROUND BOXES FOR ELECTRICAL SYSTEMS
260543	UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS
260553	ELECTRICAL SYSTEMS IDENTIFICATION
260923	LIGHTING AND CONTROL DEVICES
262200	LOW VOLTAGE TRANSFORMERS
262416	DISTRIBUTION PANELBOARDS
264300	SURGE PROTECTIVE DEVICES
265600	EXTERIOR LIGHTING
312000	EARTHWORK
312300	EXCAVATION AND FILL
312333	TRENCHING AND BACKFILLING
313119	VEGETATION CONTROL
320523	CONCRETE FOR EXTERIOR IMPROVEMENTS
321100	BASE COURSES
321123	PERMEABLE BASE FOR SYNTHETIC TURF SYSTEM
321200	FLEXIBLE PAVING
321216.10	TRACK ASPHALT PAVING
321300	RIGID PAVING
321813	SYNTHETIC TURF SYSTEM
321823.10	SYNTHETIC RUNNING TRACK SURFACING-MATERIALS ONLY (DISTRICT PURCHASED THROUGH CMAS UNDER SEPARATE CONTRACT)
321823.20	SYNTHETIC RUNNING TRACK SURFACING-INSTALLATION ONLY
321823.53	ATHLETIC AND RECREATIONAL SURFACING
323113	CHAIN LINK FENCE AND GATES

323119	**DECORATIVE METAL FENCES AND GATES – ECHELON II**
323119	**DECORATIVE METAL FENCES AND GATES – MONTAGE II**
329200	**TURF AND GRASSES**
330516	**UTILITY STRUCTURES**
331000	**WATER UTILITIES**
334000	**STORM DRAINAGE UTILITIES**
	APPENDIX 'A': HORTICULTURAL SOILS REPORT

NOTICE TO BIDDERS

Notice is hereby given that the Merced City School District (hereinafter referred to as "Owner"), acting by and through its Governing Board, will receive sealed bids prior to but no later than **TIME, DAY OF THE WEEK MONTH DATE YEAR, for:**

Tenaya Middle School Sports Field Renovation
Bid # 2025-4

as per drawings and specifications, which may now be obtained from the Architect:

TANAKA DESIGN GROUP
ATTN:
Bob Tanaka
bob@tanakadesign.com
3755 Balboa Street, Suite 204
San Francisco, CA 94121
415-845-7340

Bids will be publicly opened and read aloud at SAME DATE AND TIME LISTED ABOVE at the Merced City School District, Facilities Services Department Operational Center (OSSC), 2111 Wardrobe Avenue, Merced, CA. 95341.

Before submitting bids, all bidders **must** prequalify through the Quality Bidders website. Each bid must conform and be responsive to all pertinent Bidding and Contract Documents. Complete instructions to access documents can be requested from the MCSD Department Secretary of Facilities Services, Holly Alcorn, by email at halcorn@mcsd.k12.ca.us. Bid documents are available for review without registration at the following plan rooms:

Central California Builders Exchange	info@cencalbx.com
Valley Builders Exchange, Inc.	info@valleybx.com
Construction Bidboard (eBidBoard)	support@ebidboard.com

Bids for this **Single Prime Project** will be received for the furnishing of all labor, materials, equipment, and services for the construction of improvements (base bid items and add alternate items) designated as Sports Field Renovations Project for Tenaya Middle School. The contract time shall be 30 Calendar days from the Notice of Award, anticipated by Board Date. CONTRACTOR should consult the agreement form regarding any milestones and Liquidated Damages.

Mandatory Pre-Bid Meeting:

Contractors who plan to submit bids shall attend the: (1) Mandatory Bid Walk

Meeting Schedule:

Any contractor bidding on the project who fails to attend the Pre-Bid Conference in its entirety will be deemed non-responsive and will have its bid returned unopened.

Bids must be accompanied by a bidder's bond, cashier's check, or certified check for at least ten percent (10%) of the amount of the base bid and made payable to the Owner, as detailed in the Contract Documents, as well as the following documents: Bid Form, Designation of Subcontractors, Non-Collusion Declaration, Iran Contracting Act Certification, Sufficient Funds Declaration, Fingerprinting Notice and Acknowledgment, Workers' Compensation Certificate, Drug Free Workplace Certificate, Notice Regarding Russia-Related Sanctions, DVBE Certificate, DVBE Prime Bidder Worksheet, Payment Bond, as outlined in the "Instruction to Bidders".

Pursuant to the Contract Documents, the successful bidder will be required to furnish a Payment (Labor and Material) Bond in the amount of one hundred percent (100%) of the Contract Sum, and a Faithful Performance Bond in the amount of one hundred percent (100%) of the Contract Sum.

Advertisement Dates:
First Publication:
Second Publication:
Bid Date:

Merced City School District
Bryan Behn, Director of Facilities
BBehn@mcsd.k12.ca.us
Cell: 209-631-7389 Office: 209-385-6332

INSTRUCTIONS TO BIDDERS

SECURING DOCUMENTS:

Drawings and Specifications are available at:

TANAKA DESIGN GROUP
ATTN:
Bob Tanaka
bob@tanakadesign.com
3755 Balboa Street, Suite 204
San Francisco, CA 94121

415-845-7340

Bid documents are available for review without registration at the following plan rooms:

Central California Builders Exchange	info@cencalbx.com
Valley Builders Exchange, Inc.	info@valleybx.com
Construction Bidboard (eBidBoard)	support@ebidboard.com

BID FORMAT:

TENAYA MIDDLE SCHOOL SPORTS FIELD RENOVATION
Bid # 2025-4

PREQUALIFICATION:

This Project is subject to prequalification. Prequalification Applications must be submitted through Quality Bidders and can be accessed on the Merced City School District webpage at:
https://www.mcsd.k12.ca.us/District/Department/1-Facilities/Portal/upcoming-projects-and-contractor-information

REGISTRATION:

The Owner shall not accept any bid as of March 1, 2015, or enter into any contract as of April 1, 2015, without proof of the bidder's current registration to perform public work under Labor Code section 1725.5.

The bidder shall not accept any sub-bid as of March 1, 2015, or enter into any subcontract as of April 1, 2015, without proof of the subcontractor's current registration to perform public work under Labor Code section 1725.5.

BIDS:

Bids to receive consideration shall be made in accordance with the following instructions:

1. Bids shall be made on a form therefor, obtained from the Architect or Owner. Bids not made on the proper form shall be disregarded. Numbers must be stated in words and figures, and the signatures of all individuals must be in longhand.

2. No bid will be considered which makes exceptions, changes, or in any manner makes reservations to the terms of the drawings or specifications.

3. Questions regarding documents, discrepancies, omissions, or doubt as to meanings shall be referred immediately to the Architect who will send written instructions clarifying such questions to each bidder. Oral responses will not be binding on the Owner or Architect or any Construction Manager.

4. Each bid must give the full business address of the bidder and be signed by bidder with bidder's usual signature. Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by a general partner with authority to bind the partnership in such matters, followed by the signature and designation of the person signing. The name of the person signing shall also be typed or printed below the signature. Bids by corporations must be signed with the legal name of the corporation, followed by the name of the state of incorporation and by the signature and designation of the chairman of the board, president or any vice president, and then followed by a second signature by the secretary, assistant secretary, the chief financial officer or assistant treasurer. All persons signing must be authorized to bind the corporation in the matter. The name of each person signing shall also be typed or printed below the signature. Satisfactory evidence of the authority of the officer signing on behalf of a corporation shall be furnished.

5. Pursuant to the provisions of Sections 4100 to 4114, inclusive, of the Public Contract Code of the State of California, which are hereby incorporated and made a part hereof and these Instructions to Bidders, every bidder shall set forth in its bid:

    A. The name and location of the place of business and the California contractor’s license number of each subcontractor who will perform work or labor or render service to the bidder in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the bidder, specially fabricates and installs a portion of the Work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half (½) of one percent (1%) of the bidder's total bid. An inadvertent error in listing a California contractor’s license number shall not be grounds for filing a bid protest or for considering the bid

nonresponsive if the bidder submits the corrected contractor's license number to the Owner within 24 hours after the bid opening, or any continuation thereof, so long as the corrected contractor's license number corresponds to the submitted name and location for that subcontractor.

B. The portion of the Work which will be done by each such subcontractor. If the bidder fails to specify a subcontractor for any portion of the Work to be performed under the Contract in excess of one-half (½) of one percent (1%) of the bidder's total bid, the bidder agrees to perform that portion itself. The successful bidder shall not, without the consent of the Owner:

1) Substitute any person as subcontractor in place of the subcontractor designated in the original bid.

2) Permit any subcontract to be assigned or transferred or allow it to be performed by anyone other than the original subcontractor listed in the bid.

3) Sublet or subcontract any portion of the Work in excess of one-half (½) of one percent (1%) of the total bid as to which the original bid did not designate a subcontractor.

6. The Director of Industrial Relations of the State of California, in the manner provided by law, has ascertained the general prevailing rate of per diem wages and the rate for legal holidays and overtime work. The Contractor must pay for any labor therein described or classified in an amount not less than the rates specified. Copies of the required rates are on file at the Owner's business office and are available to any interested party on request.

7. All bids must be accompanied by a completed Noncollusion Declaration and Sufficient Funds Declaration (Labor Code § 2810). All bids must be accompanied by an executed Fingerprinting Notice and Acknowledgment.

8. Bids must be accompanied by a certified check, cashier's check, or bidder's bond, for an amount not less than ten percent (10%) of the amount of the base bid, made payable to the order of the Owner. If a bidder's bond accompanies the bid, said bond shall be secured by an Admitted Surety (an insurance organization authorized by the Insurance Commissioner to transact business of insurance in the State of California during this calendar year). The surety insurer must, unless otherwise agreed to by Owner in writing, at the time of issuance of the bond, have a rating not lower than "A-" as rated by A.M. Best Company, Inc. or other independent rating companies. Owner reserves the right to approve or reject the surety insurer selected by Contractor and to require Contractor to obtain a bond from a surety insurer satisfactory to the Owner. Said check or bond shall be given as a guarantee that the bidder will enter into the Contract if awarded the Work, and in case of refusal or failure to enter into said Contract, the check or bond, as

the case may be, shall be payable to the Owner and retained as liquidated damages.

9. Bids shall be sealed and filed as indicated in the Notice to Bidders. Irrespective of how a bidder chooses to deliver the bid and other documents to the Owner, the bidder is responsible for ensuring that the bid and other documents are actually received at the location designated in the Contract Documents for receipt of the bid and other documents prior to the time for the bid opening. Bids and other documents for any reason not actually received at the designated location prior to the time for the bid opening shall not be opened or considered.

10. **THIS CONTRACT IS SUBJECT TO THE DVBE REQUIREMENTS OF EDUCATION CODE SECTION 17076.11.**

WITHDRAWAL OF BIDS:

Bids may be withdrawn by bidders prior to the time fixed for the submittal of bids or any authorized postponement thereof. A successful bidder shall not be relieved of the bid unless by consent of the Owner or bidder's recourse to Public Contract Code §5100 et seq.

OPENING OF BIDS:

Opening of bids shall be as soon after the hour set as will be possible; opening and declaration to be as set forth in the Notice to Bidders. Any and all bidders will be permitted to attend.

EXAMINATION OF CONTRACT DOCUMENTS AND SITE:

Before submitting a bid, bidders shall examine the drawings, read the specifications, the form of Agreement between Contractor and Owner, and the other Contract Documents. Bidders shall visit the site of the proposed Work, examine the building, or buildings, if any, and any work that may have been done thereon. Bidders shall fully inform themselves of all conditions, in, at, and about the site, the building or buildings, if any, and any work that may have been done thereon.

Pursuant to Public Contract Code section 1104: 1) bidders shall not be required to assume responsibility for the completeness and accuracy of architectural or engineering plans and specifications, except on clearly designated design build projects; 2) however, bidders shall be required to review architectural or engineering plans and specifications prior to submission of their bids and to report any errors and omissions to the Architect or Owner; and 3) the review shall be confined to the bidder’s capacity as a bidder and not as a licensed design professional.

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR:

The form of Agreement between Owner and Contractor which the successful bidder will be required to execute, if awarded the Work, is a part of this Bid Package.

ADDENDA OR BULLETINS:

Any addenda or bulletins, issued during the time of bidding, shall form a part of the drawings and specifications loaned to the bidder for the preparation of its bid, shall be covered in the bid, and shall be made a part of the Contract Documents. All addenda or bulletins shall be signed by the Architect and approved by the Division of State Architect.

EVIDENCE OF RESPONSIBILITY:

Upon the request of Owner, a bidder shall submit promptly to the Owner or its designee satisfactory evidence showing the bidder's financial resources, the bidder's experience in the type of work required by the Owner, the bidder's organization available for the performance of the Contract, and any other required evidence of the bidder's or its subcontractor's qualifications to perform the proposed Contract. The Owner may consider such evidence before making its decision awarding the proposed Contract. Failure to submit evidence of the bidder's or its subcontractors' responsibility to perform the proposed Contract may result in rejection of the bid.

AWARD OF CONTRACT:

Rejection of any or all bids, to contract work with whomever and in whatever manner, to abandon work entirely, and/or to waive any informality in receiving of bids is reserved as the right of the Owner. Before the Contract is awarded, the Owner may at its sole discretion, require from the proposed Contractor on the Project further evidence of the reasonable qualifications of such contractor to faithfully, capably, and reasonably perform such proposed Contract and may consider such evidence before making its decision on the award of such proposed Contract.

The Contract shall be awarded to the lowest responsible and responsive bidder as interpreted by the Owner under California law and as specified herein and shall be entered into by the successful bidder within ten (10) days after mailing, faxing or delivery of the Notice of Award of Contract. Owner reserves the right, without any liability, to cancel the award of any bid for any reason at any time before the full execution of the Agreement between Owner and Contractor.

EXECUTION OF AGREEMENT BETWEEN OWNER AND CONTRACTOR:

The Agreement between Owner and Contractor shall be signed by the successful bidder in as many originals as the Owner deems necessary and returned, together with the

required Contract bonds, insurance certificates, additional insured endorsement, declarations page, a Public Contract Code section 3006(a) Roof Project Certification, if required, and Independent Contractor Student Contact Form, within ten (10) days after the mailing, faxing or delivering of the Notice of Award of Contract. If the ten (10) day period would expire after the date for commencement of the Work, Contractor must submit the documents before the date of commencement of the Work. If the successful bidder does not comply with this paragraph, Owner may revoke and/or cancel the award to the successful bidder and award the Contract to the next lowest bidder, or may otherwise proceed as allowed by law. A Roof Project Certification is not required if (1) the Owner has ADA (average daily attendance) of 2,500 or less, or (2) the Project involves repair of 25% or less of the roof, or costs $21,000 or less.

CONTRACT BONDS:

As required by the Contract Documents, two bonds, as itemized below and in the forms presented in these Contract Documents, shall be furnished by the successful bidder on the Project at the time of entering into the Contract and filed with the Owner before the successful bidder commences any work on the Project. They shall be in the form of surety bonds issued by Admitted Surety insurers (an insurance organization authorized by the Insurance Commissioner to transact business of insurance in the State of California during this calendar year). The surety insurers must, unless otherwise agreed to by Owner in writing, at the time of issuance of the bond, have a rating not lower than "A-" as rated by A.M. Best Company, Inc. or other independent rating companies. Owner reserves the right to approve or reject the surety insurers selected by Contractor and to require Contractor to obtain bonds from surety insurers satisfactory to the Owner.

> **Performance Bond** in the amount of one hundred percent (100%) of the Contract Sum to insure Owner during construction, and for one year after completion and during any warranty or guaranty period, against faulty or improper materials or workmanship and to assure Owner of full and prompt performance of the Contract.
>
> **Payment Bond** (Labor and Material) in the amount of one hundred percent (100%) of the Contract Sum in accordance with the laws of the State of California to secure payment of any and all claims for labor and materials used or consumed in performance of this Contract.

DRAWINGS, SPECIFICATIONS AND ADDENDA OR BULLETINS:

Return by each bidder of all drawings, specifications and addenda or bulletins in an unmutilated condition and without any marks or annotations is demanded within the time limit indicated under **DEPOSIT** in this section.

SUBSTITUTION OF MATERIALS:

The Contractor must ensure that the proposed substitutions by the Contractor or its subcontractors are submitted to the Architect's office a minimum of fourteen (14) calendar days prior to the Bid Opening for review and possible approval of any equipment or materials thought to be equal to or better than those specified in the drawings or specifications. An addendum will be issued seven (7) calendar days prior to Bid Opening, including all equipment and materials deemed equivalent to those specified and approved by the Architect. Submittals shall include comparative spec-data of the specified equipment or material and the proposed substitution as set forth in the Contract Documents. Submittals without this information will be automatically rejected.

PAYMENTS:

Payments to the Contractor on account of the Contract shall be made in accordance with the terms of the Contract Documents.

TAXES:

The Owner is generally exempt from payment of Federal Excise Tax on materials. The Owner will furnish exemption certificates to the Contractor to be used to obtain materials ordinarily subject to Federal Excise Tax without payment of the tax. Bidder shall deduct Federal Excise Taxes from their bid prices before submitting bids, so that such taxes will not be included in the Contract Sum.

EARLY TERMINATION:

Notwithstanding any provision herein to the contrary, if for any fiscal year of this Contract the governing body of the Owner fails to appropriate or allocate funds for future periodic payments under the Contract after exercising reasonable efforts to do so, the Owner may upon thirty (30) days' notice, order work on the Project to cease. The Owner will remain obligated to pay for the work already performed but shall not be obligated to pay the balance remaining unpaid beyond the fiscal period for which funds have been appropriated or allocated and for which the work has not been done.

TIME OF COMPLETION AND LIQUIDATED DAMAGES:

Time of completion for the Project shall be **Three Hundred Sixty (360)** calendar days, including the plant establishment period from (a) the date of commencement of the Work as established in the Owner’s Notice to Proceed, or (b) if no other date is established in a Notice to Proceed from Owner, the date of Contractor’s actual commencement of the Work (including mobilization).

Liquidated damages will accrue and may be assessed as provided in the Contract Documents. Should said Work not be completed within the time limit as may be extended as herein provided, damages will be sustained by the Owner. It is understood and agreed that it is and will be impracticable or extremely difficult to determine the actual amount of damages which the Owner will sustain in the event of and by reason of

such delay, and it is therefore agreed that the Contractor will pay the Owner the sum of **($1,000.00) per calendar day** for each and every day's delay beyond the time specified as and for liquidated damages, during or as a result of each calendar day by which completion of the Project is delayed beyond the completion date; in case the Contractor fails to make such payment, the Owner may deduct the amount thereof from any money due or that may become due the Contractor under the Contract. Should such money not be sufficient, the Owner shall have the right to recover the balance from the Contractor or its sureties.

BID FORM

Merced, California

Merced City School District
Facilities Department
2111 Wardrobe Avenue
Merced, CA 95341

Dear Board Members:

The undersigned doing business under the firm name of:

_____

hereby propose and agree to enter into a Contract, to furnish any and all labor, materials, applicable taxes, equipment and services for the completion of Work described hereinafter and in the Contract Documents:

TENAYA MIDDLE SCHOOL SPORTS FIELD RENOVATION
Bid # 2025-4

prepared by:

TANAKA DESIGN GROUP
3755 BALBOA STREET SUITE 204
SAN FRANCISCO, CA 94121
415-845-7340

Schedule of Bid Prices:

All applicable sales taxes, State and/or Federal, and any other special taxes, patent rights or royalties are included in the price quoted in this Proposal.

Bidder's attention is directed to the Instruction to Bidders.

Bidder acknowledges and agrees that the Base Bid Schedule A and the Base Bid Schedule B accounts for all items in contract documents.

BID SCHEDULE A - SPORTS FIELD RENOVATIONS					
ITEM NO.	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**ITEM TOTAL**
1	Mobilization, including Tree Protection, Construction Fencing, Modifying Irrigation, Water, Storm or Sewer Systems, Salvaging Utilities. Item total shall not exceed 3% of the Total Bid Schedule 'A'.	LS	1		
2	Temporary Erosion Control, including Erosion Control Roll and Stabilized Construction Surface (see Schedule B for exceptions)	LS	1		
3	Demolition including Clearing and Grubbing, as designated on plans (see Schedule B for exceptions)	LS	1		
4	Construction Surveying and Staking	LS	1		
5	Earthwork	LS	1		
6	Storm Drainage System: Connection to Existing Storm Drain System, Storm Drain Pipe, Perforated Pipes, Catch Basins, Cleanouts, Manholes, Slot Drain and Catch Basins at Track, Drainage at Bio-Retention System	LS	1		
7	Potable Water System: Connection to Existing Backflow Prevention Device, Water Pipe to Drinking Fountains and to location of Add Alternate #1 Concession Building, Shut-off Valves	LS	1		

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	ITEM TOTAL
8	Sanitary Sewer System: Connection to existing main line, Sanitary Sewer Pipe to location of Add Alternate #1 Concession Building, Cleanouts	LS	1		
9	Concrete Paving	SF	24,441		
10	Concrete Band, 6" Wide	LF	208		
11	Concrete Band, 12" Wide	LF	1,544		
12	Concrete Band, 18" Wide, at all Chainlink Fencing at Softball and Baseball Fields Only	LF	1,615		
13	Wood Header	LF	92		
14	Decomposed Granite Paving	SF	560		
15	Asphalt Paving at Sports Court (Re-Use Existing Base Rock where shown on plans)	SF	26,094		
16	Asphalt Paving, Excluding Asphalt at Track	SF	26,493		
17	Asphalt Paving at Emergency Vehicular Access Areas	SF	3,632		
18	8 Lane Track and Field, Including Asphalt Paving, Surfacing Material Installation (Owner will purchase material only through CMAS), Striping and Striping Material, Inside Track Curb, Long Jump Pit, High Jump, Shot Put Pad and Shot Put Cage, Discus Cage and Ring, and Com Box.	LS	1		
19	Chain Link Fence with Black Vinyl Coating, 4' High, at Track	LF	1,211		

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	ITEM TOTAL
20	Chain Link Gate with Black Vinyl Coating, Double Leaf, 4' High, 10' Wide, at Track	EA	1		
21	Synthetic Turf at Fitness Area, Including Synthetic Turf Surface Material, Infill, Cushion, Permeable Aggregate Base, Filter Fabric, and Nailer Board	SF	2,765		
22	Fitness Equipment	LS	1		
23	Infield Mix at Baseball and Softball Fields	SF	2,878		
24	Backstop at BallFields	EA	3		
25	Chain Link Fence at Ballfields, 6' High, with Black Vinyl Coating	LF	210		
26	Chain Link Fence at Ballfields, 8' High, with Black Vinyl Coating	LF	960		
27	Chain Link Fence at Ballfields, 12' High, with Black Vinyl Coating	LF	172		
28	Chain Link Fence at Ballfields, 8' High, Galvanized Only	LF	194		
29	Chain Link Gate at Ballfield, Single Leaf, 3' Wide, Galvanized Only	LS	1		
30	Chain Link Gate at Ballfields, Single Leaf, 3' Wide, with Black Vinyl Coating	LS	1		
31	Portable Pitching Mound	EA	2		
32	Players Bench	EA	6		
33	Sports Court Striping and Equipment (Pickleball nets and posts, Volleyball nets and posts, including sleeves)	LS	1		
34	Drinking Fountain and Bottle Filler, Including Drywell and Drainage Connections	EA	5		

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	ITEM TOTAL
35	Bollard	EA	8		
36	Electrical System: Associated Equipment and Connection to Existing Electrical Service, Boring to Booster Pump and Battery Inverter, Battery Inverter and associated Equipment	LS	1		
37	Electrical or Data Conduits (including conduit for security cameras), Conductors, Cables, and Pull Boxes	LS	1		
38	Electrical Outlets	EA	5		
39	Low Level Path Light (Includes Fixture, Pole, Footing)	EA	14		
40	Security Camera Pole (Includes Footing and Vibration Damper)	EA	1		
41	Booster Pump System, including Enclosure, Concrete Pad, and associated Components	LS	1		
42	Irrigation System	LS	1		
43	Soil Preparation	SF	391,222		
44	Turf, Seeded	SF	391,222		
45	Bio-Retention Grass, Soil Preparation, and Permeable Rock at Bio-Retention Areas	LS	1		
46	Tree, 15 Gal. Size, Including Planting and Staking	EA	109		
47	Mulch, Including Mulch Only Areas	SF	7,530		
48	Landscape Maintenance, 90 Days	LS	ALLOW		

BASE BID SCHEDULE A TOTAL: _____ DOLLARS

($)

BID SCHEDULE B - SITE SECURITY FENCING					
ITEM NO.	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**ITEM TOTAL**
1	Mobilization. Item total shall not exceed 3% of the Total Bid Schedule 'B'.	LS	1		
2	Demolition of Existing Fencing and Gates, and associated Paving	LS	1		
3	All Metal Fence Type B and all Metal Gates, including all associated Screen Panels, Hardware, Knox Boxes, and associated 18" Wide Concrete Bands.	LS	1		
4	At Electrical Equipment Enclosure and Backflow Preventer Enclosure: All Metal Fence Type A, Metal Gate, Chainlink Fencing and Chainlink Roof and Gate, with Black Vinyl Coating, and including all associated Screen Panels, Vinyl Slats, Hardware, Knox Boxes, and 18" Wide Concrete Bands	LS	1		

BASE BID SCHEDULE B TOTAL: _____ DOLLARS

($ _____)

Alternates:

Alternate No. 1:
Concession Building, Including associated Clearing, Grubbing, Earthwork, Aggregate Base, adjacent Hardscape, Fencing, Bike Rack, Planting, Irrigation.
($_____)

Alternate No. 2:
Sports Field Light Poles and Lighting Equipment, Including Mounted Low Level Lighting, Conduits, Conductors, and Footings.
($_____)

Alternate No. 3:
Irrigation and Turf at Street, including Associated Clearing, Grubbing.
($_____)

Alternate No. 4:
Acrylic Surfacing a Sports Court
($_____)

If written notice of the Award of Contract is mailed, faxed, or delivered to the undersigned at any time before this bid is withdrawn, the undersigned shall, within ten (10) days after the date of such mailing, faxing, or delivering of such notice, execute and deliver an agreement in the form of agreement present in these Contract Documents and give Performance and Payment Bonds in accordance with the specifications and bid as accepted.

The undersigned hereby designates as the office to which such Notice of Award of Contract may be mailed, faxed, or delivered:

_____

_____

Our Public Liability and Property Damage Insurance is placed with:

_____

_____

Our Workers' Compensation Insurance is placed with:

_____

_____

Circular letters, bulletins, addenda, etc., bound with the specifications or issued during the time of bidding are included in the bid, and, in completing the Contract, they are to become a part thereof.

The receipt of the following addenda to the specifications is acknowledged:

Addendum No. _____ Date _____ Addendum No. _____ Date _____

Addendum No. _____ Date _____ Addendum No. _____ Date _____

Addendum No. _____ Date _____ Addendum No. _____ Date _____

This bid may be withdrawn at any time prior to the scheduled time for the opening of bids or any authorized postponement thereof.

A bidder shall not submit a bid unless the bidder's California contractor's license number appears clearly on the bid, the license expiration date and class are stated, and the bid contains a statement that the representations made therein are made under penalty of perjury. Any bid submitted by a contractor who is not licensed pursuant to Business and Professions Code section 7028.15 shall be considered nonresponsive and shall be rejected. Any bid not containing the above information may be considered nonresponsive and may be rejected.

NOTE: Each bid must give the full business address of the bidder and be signed by bidder with bidder's usual signature. Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by a general partner with authority to bind the partnership in such matters, followed by the signature and designation of the person signing. The name of the person signing shall also be typed or printed below the signature. Bids by corporations must be signed with the legal name of the corporation, followed by the name of the state of incorporation and by the signature and designation of the chairman of the board, president or any vice president, and then followed by a second signature by the secretary, assistant secretary, the chief financial officer or assistant treasurer. All persons signing must be authorized to bind the corporation in the matter. The name of each person signing shall also be typed or printed below the signature. Satisfactory evidence of the authority of the officer signing on behalf of a corporation shall be furnished.

The undersigned declares under penalty of perjury under the laws of the State of California that the representations made in this bid are true and correct.

Print or Type Name : _____

Title: _____

Name of Company as Licensed: _____

Business Address: _____

_____

Telephone & Fax Number: _____

DIR Registration Number & Classification: _____

Email Address: _____

California Contractor License No.: _____

Class and Expiration Date: _____

State of Incorporation, if Applicable: _____

( ) Evidence of authority to bind corporation is attached.

Dated: _____, _____

Signed: _____

BID BOND

Note: This document must be executed and submitted with the bid.

KNOW ALL MEN BY THESE PRESENTS that we the undersigned _____ as Principal and _____ as Surety, are hereby held and firmly bound unto the Merced City School District "Owner" in the sum of _____ Dollars ($_____) for payment of which sum, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that whereas the Principal has submitted to the Owner a certain bid, attached hereto and hereby made a part hereof, to enter into a Contract in writing for the construction of the Work in strict accordance with Contract Documents:

TENAYA MIDDLE SCHOOL SPORTS FIELD RENOVATION
Bid # 2025-4

NOW, THEREFORE,

a. If said bid shall be rejected, or, in the alternative;

b. If said bid shall be accepted and the Principal shall execute and deliver a contract in the form of agreement attached hereto and shall execute and deliver Performance and Payment Bonds in the forms attached hereto (all properly completed in accordance with said bid), and shall in all other respects perform the agreement created by the acceptance of said bid;

Then this obligation shall be void, otherwise the same shall remain in full force and effect, it being expressly understood and agreed that the liability of the Surety for any and all default of the Principal hereunder shall be the amount of this obligation as herein stated.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract on the call for bids, or to the Work to be performed hereunder, or the specifications accompanying the same, shall in any way affect its obligation under this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of said Contract or the call for bids, or to the Work, or to the specifications.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under several seals this ____ day of _____, 2026, the name and corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body. In the presence of:

(Notary Seal)

_____
(Principal)

_____
(Business Address)

_____

_____
(Corporate Surety)

_____
Business Address)

By:_____

_____

The rate or premium of this bond is _____ per thousand, the total amount of premium charged, $_____.

(The above must be filled in by Corporate Surety).

DESIGNATION OF SUBCONTRACTORS

Note: This document must be executed and submitted with the bid.

Each bidder shall set forth below the name and the location of the place of business of each subcontractor and the California contractor license number of each subcontractor who will perform work or labor or render service to the Contractor in or about the construction of the Work or improvement, or to a subcontractor licensed by the State of California who, under subcontract to the Contractor, specially fabricates and installs a portion of the Work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent (0.5%) of the bidder's total bid, and the portion of the Work which will be done by each subcontractor. An inadvertent error in listing a California contractor's license number shall not be grounds for filing a bid protest or for considering the bid nonresponsive if the bidder submits the corrected contractor's license number to the Owner within 24 hours after the bid opening, or any continuation thereof, so long as the corrected contractor's license number corresponds to the submitted name and location for that subcontractor.

If the Contractor fails to specify a subcontractor for any portion of the Work to be performed under the Contract in excess of one-half of 1 percent (0.5%) of the Contractor's total bid, the Contractor shall be deemed to have agreed to perform such portion itself, and shall not be permitted to subcontract that portion of the Work except under the conditions hereinafter set forth.

Subletting or subcontracting of any portion of the Work as to which no subcontractor was designated in the original bid shall only be permitted in cases of public emergency or necessity, and then only after a finding reduced to writing as a public record of the legislative body of the Owner.

As of March 1, 2015, for any bid proposal submitted, and as of April 1, 2015, for any contract for public work entered into, an inadvertent error in listing a subcontractor who is not registered under Labor Code section 1725.5 shall not be grounds for filing a bid protest or grounds for considering the bid nonresponsive, provided that either: the subcontractor is registered prior to the bid opening; or the subcontractor is registered and has paid the penalty registration fee specified in Labor Code section 1725.5(a)(2)(E), if applicable, within 24 hours after the bid opening; or the subcontractor is replaced by another registered subcontractor under Public Contract Code section 4107. Failure of a listed subcontractor to be registered shall be grounds under Public Contract Code section 4107 for the Contractor, with the Owner's consent, to substitute a registered subcontractor for the unregistered subcontractor.

Failure to provide this information in a legible manner may result in the rejection of an otherwise acceptable bid.

NOTE: *Reproduce page two of this section for additional listings needed beyond the length of this form.*

Portion of Work	Name of Subcontractor & Phone No.	Location of Subcontractor	CA Contractor License Number and License Class	DIR # & Classification	Email Address

Portion of Work	Name of Subcontractor & Phone No.	Location of Subcontractor	California Contractor License Number	DIR # & Classification	Email Address

I am the authorized representative of the Bidder submitting this Designation of Subcontractors and I declare that each subcontractor listed holds a valid and current contractor license in good standing in California to perform the portion of work for which the subcontractor is listed.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____, 2026, at _____[city], CA.

Signature: _____

Print Name: _____

Title: _____

NONCOLLUSION DECLARATION
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

Owner: _____

Project: **TENAYA MIDDLE SCHOOL SPORTS FIELD RENOVATION**
Bid # 2025-4

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____, 2026, at _____ [*city*], CA.

_____
Signature

_____
Print Name

IRAN CONTRACTING ACT CERTIFICATION
(Public Contract Code sections 2202-2208)

Note: This document must be executed and submitted with the bid.

As required by Public Contract Code ("PCC") section 2204 for contracts of $1,000,000 or more, please insert bidder's or financial institution's name and Federal ID Number (if available) and complete **one** of the options below. Please note that California law establishes penalties for providing false certifications, including civil penalties equal to the greater of $250,000 or twice the amount of the contract for which the false certification was made; contract termination; and three-year ineligibility to bid on contracts. (PCC §2205.)

OPTION #1 - CERTIFICATION

I, the official named below, certify I am duly authorized to execute this certification on behalf of the bidder/financial institution identified below, and the bidder/financial institution identified below is **not** on the current list of persons engaged in investment activities in Iran created by California Department of General Services ("DGS") and is not a financial institution extending twenty million dollars ($20,000,000) or more in credit to another person/bidder, for 45 days or more, if that other person/bidder will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS. (PCC §2204(a).)

Bidder Name/Financial Institution (Printed)	*Federal ID Number (or n/a)*
By (Authorized Signature)	
Printed Name and Title of Person Signing	
Date Executed	*Executed in*

OPTION #2 – EXEMPTION

Pursuant to Public Contract Code sections 2203(c) and (d), a public entity may permit a bidder/financial institution engaged in investment activities in Iran, on a case-by-case basis, to be eligible for, or to bid on, submit a proposal for, or enters into or renews, a contract for goods and services. If you have obtained an exemption from the certification requirement under the Iran Contracting Act, please fill out the information below, and attach documentation demonstrating the exemption approval.

Bidder Name/Financial Institution (Printed)	*Federal ID Number (or n/a)*
By (Authorized Signature)	
Printed Name and Title of Person Signing	*Date Executed*

Sufficient Funds Declaration
(Labor Code section 2810)
To Be Executed by Bidder and Submitted with Bid

Owner: _____
Project: **Tenaya Middle School Sports Field Renovation**
Bid # 2025-4

I, _____, declare that I am the _____ of _____, the entity making and submitting the bid for the above Project that accompanies this Declaration, and that such bid includes sufficient funds to permit _____ [insert name of entity] to comply with all local, state or federal labor laws or regulations during the Project, including payment of prevailing wage, and that _____[the entity] will comply with the provisions of Labor Code section 2810(d) if awarded the Contract.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and executed on _____2026, at _____ Merced, CA.

Date:_____ _____
Signature
Print Name: _____
Print Title: _____

FINGERPRINTING NOTICE AND ACKNOWLEDGMENT
(Education Code Section 45125.2(a))

Note: This document must be executed and submitted with the bid.

Business entities entering into contracts with the Owner for the construction, reconstruction, rehabilitation or repair of a facility must comply with Education Code sections 45125.1 and 45125.2. Such entities are responsible for ensuring full compliance with the law and should therefore review all applicable statutes and regulations. The following information is provided simply to assist such entities with compliance with the law.

1. If the Owner determines your employee(s) will have more than limited contact with students, then you must take one or more of the following steps:

   a. Install a physical barrier at the worksite to limit contact with pupils.

   b. Have an employee, who the Department of Justice has ascertained has not been convicted of a violent or serious felony, continually monitor and supervise employees. The entity shall verify in the Independent Contractor Student Contact Form to the Owner that the employee charged with monitoring and supervising its employees has no such convictions. (See attached.)

   c. Arrange, with Owner's approval, for surveillance by Owner's personnel.

   If one or more of these steps is taken, you are not required to comply with Education Code section 45125.1.

2. If you are providing the services in an emergency or exceptional situation, you are not required to comply with Education Code section 45125.2. An "emergency or exceptional" situation is one in which pupil health or safety is endangered or when repairs are needed to make a facility safe and habitable. Owner shall determine whether an emergency or exceptional situation exists.

I have read the foregoing and agree to comply with the requirements of Education Code §§ 45125.1 and 45125.2 as applicable.

Dated: _____ _____
Signature

Name: _____ Title: _____

ATTACHMENT

Under Education Code section 45125.1, no employee of a contractor or subcontractor who has been convicted of or has criminal proceedings pending for a violent or serious felony may come into contact with any student. A violent felony is any felony listed in subdivision (c) of Section 667.5 of the Penal Code. Those felonies are presently defined as:

(1) Murder or voluntary manslaughter.

(2) Mayhem.

(3) Rape as defined in paragraph (2) or (6) of subdivision (a) of Section 261 or paragraph (1) or (4) of subdivision (a) of Section 262.

(4) Sodomy as defined in subdivision (c) or (d) of Section 286.

(5) Oral copulation as defined in subdivision (c) or (d) of Section 288a.

(6) Lewd or lascivious act as defined in subdivision (a) or (b) of Section 288.

(7) Any felony punishable by death or imprisonment in the state prison for life.

(8) Any felony in which the defendant inflicts great bodily injury on any person other than an accomplice which has been charged and proved as provided for in Section 12022.7, 12022.8, or 12022.9 on or after July 1, 1977, or as specified prior to July 1, 1977, in Sections 213, 264, and 461, or any felony in which the defendant uses a firearm which use has been charged and proved as provided in subdivision (a) of Section 12022.3, or Section 12022.5 or 12022.55.

(9) Any robbery.

(10) Arson, in violation of subdivision (a) or (b) of Section 451.

(11) Sexual penetration as defined in subdivision (a) or (j) of Section 289.

(12) Attempted murder.

(13) A violation of Section 18745, 18750, or 18755.

(14) Kidnapping.

(15) Assault with the intent to commit a specified felony, in violation of Section 220.

(16) Continuous sexual abuse of a child, in violation of Section 288.5.

(17) Carjacking, as defined in subdivision (a) of Section 215.

(18) Rape, spousal rape, or sexual penetration, in concert, in violation of Section 264.1.

(19) Extortion, as defined in Section 518, which would constitute a felony violation of Section 186.22 of the Penal Code.

(20) Threats to victims or witnesses, as defined in Section 136.1, which would constitute a felony violation of Section 186.22 of the Penal Code.

(21) Any burglary of the first degree, as defined in subdivision (a) of Section 460, wherein it is charged and proved that another person, other than an accomplice, was present in the residence during the commission of the burglary.

(22) Any violation of Section 12022.53.

(23) A violation of subdivision (b) or (c) of Section 11418.

A serious felony is any felony listed in subdivision (c) Section 1192.7 of the Penal Code. Those felonies are presently defined as:

(1) Murder or voluntary manslaughter; (2) Mayhem; (3) Rape; (4) Sodomy by force, violence, duress, menace, threat of great bodily injury, or fear of immediate and unlawful bodily injury on the victim or another person; (5) Oral copulation by force, violence, duress, menace, threat of great bodily injury, or fear of immediate and unlawful bodily injury on the victim or another person; (6) Lewd or lascivious act on a child under the age of 14 years; (7) Any felony punishable by death or imprisonment in the state prison for life; (8) Any felony in which the defendant personally inflicts great bodily injury on any person, other than an accomplice, or any felony in which the defendant personally uses a firearm; (9) Attempted murder; (10) Assault with intent to commit rape, or robbery; (11) Assault with a deadly weapon or instrument on a peace officer; (12) Assault by a life prisoner on a non-inmate; (13) Assault with a deadly weapon by an inmate; (14) Arson; (15) Exploding a destructive device or any explosive with intent to injure; (16) Exploding a destructive device or any explosive causing bodily injury, great bodily injury, or mayhem; (17) Exploding a destructive device or any explosive with intent to murder; (18) Any burglary of the first degree; (19) Robbery or bank robbery; (20) Kidnapping; (21) Holding of a hostage by a person confined in a state prison; (22) Attempt to commit a felony punishable by death or imprisonment in the state prison for life; (23) Any felony in which the defendant personally used a dangerous or deadly weapon; (24) Selling, furnishing, administering, giving, or offering to sell, furnish, administer, or give to a minor any heroin, cocaine, phencyclidine (PCP), or any

methamphetamine-related drug, as described in paragraph (2) of subdivision (d) of Section 11055 of the Health and Safety Code, or any of the precursors of methamphetamines, as described in subparagraph (A) of paragraph (1) of subdivision (f) of Section 11055 or subdivision (a) of Section 11100 of the Health and Safety Code; (25) Any violation of subdivision (a) of Section 289 where the act is accomplished against the victim's will by force, violence, duress, menace, or fear of immediate and unlawful bodily injury on the victim or another person; (26) Grand theft involving a firearm; (27)carjacking; (28) any felony offense, which would also constitute a felony violation of Section 186.22; (29) assault with the intent to commit mayhem, rape, sodomy, or oral copulation, in violation of Section 220; (30) throwing acid or flammable substances, in violation of Section 244; (31) assault with a deadly weapon, firearm, machine gun, assault weapon, or semiautomatic firearm or assault on a peace officer or firefighter, in violation of Section 245; (32) assault with a deadly weapon against a public transit employee, custodial officer, or school employee, in violation of Sections 245.2, 245.3, or 245.5; (33) discharge of a firearm at an inhabited dwelling, vehicle, or aircraft, in violation of Section 246; (34) commission of rape or sexual penetration in concert with another person, in violation of Section 264.1; (35) continuous sexual abuse of a child, in violation of Section 288.5; (36) shooting from a vehicle, in violation of subdivision (c) or (d) of Section 26100; (37) intimidation of victims or witnesses, in violation of Section 136.1; (38) criminal threats, in violation of Section 422; (39) any attempt to commit a crime listed in this subdivision other than an assault; (40) any violation of Section 12022.53; (41) a violation of subdivision (b) or (c) of Section 11418; and (42) any conspiracy to commit an offense described in this subdivision.

INDEPENDENT CONTRACTOR STUDENT CONTACT FORM

Contractor Name: _____
Supervisor/Foreman Name: _____
Start Date: _____
Completion Date: _____
Location of Work: _____
Hours of Work: _____
Length of Time on Grounds: _____
Number of Employees on the Job: _____

Yes No
[ ] [ ] Employees will have more than limited contact with students as determined by Owner, or if by Contractor, please explain:

_____
_____

If yes, the following steps will be taken to ensure student safety (check):

[ ] A physical barrier will be installed at the worksite to limit contact with pupils.

[ ] Employees will be continually monitored and supervised by an employee who has not been convicted of a violent or serious felony.

Name of Supervising Employee:

_____

Date of Department of Justice verification that supervising employee has not been convicted of a violent or serious felony:

_____

Name of employee who is the custodian of the Department of Justice verification information:

_____

[ ] Owner agrees: Employees will be surveilled by Owner's personnel.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Dated: _____

_____
Signature
Typed Name: _____
Title: _____

Note: This document must be executed and submitted with the executed Agreement between Owner and Contractor.

WORKERS' COMPENSATION CERTIFICATE

Labor Code Section 3700, in relevant part, provides:

> "Every employer except the state shall secure the payment of compensation in one or more of the following ways:
>
> (a) By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this state.
>
> (b) By securing from the Director of Industrial Relations a certificate of consent to self-insure either as an individual employer or as one employer in a group of employers. Said certificate may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his or her employees, … "

I am aware of the provisions of the Labor Code Section 3700, which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract. I shall supply the Owner with certificates of insurance evidencing that Workers' Compensation Insurance is in effect and providing that the Owner will receive thirty (30) days' notice of cancellation.

_____
Name of Contractor

_____
Signature

_____ _____
Print Name Date

(In accordance with Article 5 (commencing at Section 1860], Chapter 1, Part 7, Division 2 of the Labor Code, the above certificate must be signed and filed with the awarding body prior to performing any work under the contract.)

DRUG-FREE WORKPLACE CERTIFICATION

This Drug-Free Workplace Certification is required pursuant to Government Code Sections 8350 *et seq*., the Drug-Free Workplace Act of 1990. The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract or grant for the procurement of any property or services from any State agency must certify that it will provide a drug-free workplace by doing certain specified acts. In addition, the Act provides that each contract awarded by a State agency may be subject to suspension of payments or termination of the contract, or both, and the contractor may be subject to debarment from future contracting if the state agency determines that specified acts have occurred.

Pursuant to Government Code Section 8355, every person or organization awarded a contract or grant from a State agency shall certify that it will provide a drug-free workplace by doing all of the following:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in the person's or organization's workplace and specifying actions which will be taken against employees for violations of the prohibition;

(b) Establishing a drug-free awareness program to inform employees about all of the following:

(1) The dangers of drug abuse in the workplace;
(2) The person's or organization's policy of maintaining a drug-free workplace;
(3) The availability of drug counseling, rehabilitation and employee-assistance programs;
(4) The penalties that may be imposed upon employees for drug abuse Violations;

(c) Requiring that each employee engaged in the performance of the contract or grant be given a copy of the statement required by subdivision (a) and that, as a condition of employment on the contract or grant, the employee agrees to abide by the terms of the statement.

I, the undersigned, agree to fulfill the terms and requirements of Government Code Section 8355 listed above and will publish a statement notifying employees concerning (a) the prohibition of controlled substance at the workplace, (b) establishing a drug-free awareness program, and (c) requiring that each employee engaged in the performance of the contract or grant be given a copy of the statement required by Section 8355(a) and requiring that the employee agree to abide by the terms of that statement.

I also understand that if the Owner determines that I have either (a) made a false certification herein, or (b) violated this certification by failing to carry out the requirements of Section 8355, that the contract or grant awarded herein is subject to suspension of payments, termination, or both. I further understand that should I violate the terms of the Drug-Free Workplace Act of 1990, I may be subject to debarment in accordance with the requirements of Section 8350 *et seq*.

I acknowledge that I am aware of the provisions of Government Code Section 8350 *et seq*. and hereby certify that I will adhere to the requirements of the Drug-Free Workplace Act of 1990.

_____
Name of Contractor

_____
Signature

_____ _____
Print Name Date

NOTICE AND CERTIFICATION REGARDING RUSSIA-RELATED SANCTIONS

(Executive Order N-6-22)

District: **Merced City School District**
Project: **Tenaya Middle School Sports Field Renovation**
Contract:
Contract Date:
Company (Name): _____

NOTICE:

On March 4, 2022, California Governor Gavin Newsom issued Executive Order No. N-6-22 ("Executive Order") relating to sanctions imposed by the U.S. government and the State of California ("State") in response to actions in Ukraine by the Russian Federation ("Russia").

Among other things, the Executive Order "calls upon businesses, non-governmental organizations, and public entities in the State to review their investments and contracts to ensure their compliance with economic sanctions imposed by the U.S. government in response to Russia's actions in Ukraine, as well as any sanctions imposed under state law (collectively, economic sanctions), and to take actions to support the Ukrainian government and people, including by refraining from new investments in, and financial transactions with, Russian institutions or companies that are headquartered or have their principal place of business in Russia (Russian entities), not transferring technology to Russia or Russian entities, and directly providing support to the government and people of Ukraine."

The Executive Order requires that all State agencies and departments subject to the Governor's authority: (i) review contracts for commodities, services, and technology to determine compliance with such federal and State economic sanctions ("Economic Sanctions"); (ii) terminate contracts with entities or individuals that are a target of the Economic Sanctions; and (iii) not enter into any additional contracts with such entities or individuals.

The Executive Order further requires that each State agency and department: (i) notify all grantees of the agency or department (each a "Grantee") and contractors with contracts of $5 million or more (each, a "State Contractor") of their obligations to comply with the Economic Sanctions; (ii) direct all Grantees and State Contractors to report to the agency or department regarding their compliance with the Economic Sanctions; and (iii) direct all Grantees and State Contractors to report on steps they have taken in response to Russia's activities in Ukraine.

CERTIFICATION:

The undersigned hereby certifies to the District, subject to penalty for perjury pursuant to the laws of the State of California, that all of the following is true and correct:

(i) I am a duly authorized representative of the Company identified above in this form and, in that capacity, I have executed this certification on behalf of the Company.

(ii) The Company acknowledges that, in connection with various programs, services, and activities undertaken by the District from time to time, the District receives grant funding provided through one or more State agencies or departments.

(iii) The Company represents and warrants that neither the Company nor any of its directors, officers, or affiliates: (i) invests in, or has financial transactions with Russian institutions or companies that are headquartered or have their principal place of business in Russia ("Russian Entities"); or (ii) transfers technology to Russia or any Russian Entities.

(iv) The Company represents and agrees that, in connection with the Contract identified above in this form, and in connection with their activities pursuant to such Contract, neither the Company nor any of its directors, officers, or affiliates shall engage in any of the activities described in the foregoing Clause (iii) of this form, or otherwise violate any of the Economic Sanctions.

(v) The Company acknowledges and agrees that, while the Contract is in effect, if the Company or any of its directors, officers, or affiliates engages in any of the activities described in the foregoing Clause (iii) of this form, or otherwise violates any of the Economic Sanctions, then, following notice and 30-day opportunity for the Company to submit a written response, and in the District's sole discretion or as may be required by the State, the District may terminate the Contract and, in addition, the District and/or State may take any and all other actions as permitted by applicable law.

Representative Name: _____

Representative Title: _____

Representative Signature: _____

Date Signed: _____

PRIME BIDDER CERTIFICATION OF DISABLED VETERAN BUSINESS ENTERPRISE PARTICIPATION

To be completed by the Prime Bidder

PART I – IDENTIFICATION INFORMATION

BIDDER'S NAME	BUSINESS ADDRESS	TELEPHONE NUMBER
SCHOOL DISTRICT Merced City School District	**COUNTY** Merced	**APPLICATION NO.**

PART II – METHOD OF COMPLIANCE WITH DVBE PARTICIPATION GOALS – Include this form and any other applicable documents listed in this table with your bid/proposal. Read the three columns in the table below as sentences from left to right. Check the appropriate box to indicate your method of committing the contract dollar amount.

NOTE: *Architectural, engineering, environmental, land surveying or construction management firms must indicate their method of compliance by marking the appropriate box A, B, C, or D after selection by the District and before the contract is signed.*

YOUR BUSINESS ENTERPRISE	AND YOU	AND YOU
A. ☐ *is Disabled Veteran owned and your forces, will perform at least 3 percent of this contract*	*will include a copy of your DVBE letter from the Office of Small Business and Disabled Veteran Business Enterprise Services (OSDS).*	
B. ☐ *is Disabled Veteran owned* ***but is unable*** *to perform the 3 percent of this contract with your forces*	*will use DVBE subcontractors/ suppliers to bring the contract participation to at least 3 percent*	*will include a copy of each DVBE's letter from OSDS (including yours, if applicable).*
C. ☐ *is* ***not*** *Disabled Veteran owned*	*will use DVBE subcontractors/ suppliers for at least 3 percent of this contract*	
D. ☐ *is unable to meet the required participation goals*	*will complete a Good Faith Effort to obtain DVBE participation*	*will include the Prime Bidder's Good Faith Effort Worksheet.*

Note: An Office of Small Business and Disabled Veteran Business Enterprise Services (OSDS) letter must be attached for each DVBE participating in the contract. The DVBE letter is obtained by application through the OSDS and must be provided at the time of bid opening. If the letter is not provided, the bid may be deemed nonresponsive and may be ineligible for award of the contract.

Continued on reverse side

PART III – DVBE DOLLAR PARTICIPATION OF BID/PROPOSAL – *Architectural, engineering, environmental, land surveying or construction management firms complete this part* ***after*** *selection by the district and before the contract is signed.*

Show deductive alternate(s) in parenthesis. For more alternates/base bids, use a separate page to show items.

A. If your business enterprise is a DVBE, list in the appropriate column the total dollar amount of your bid to be performed by your own participation.

B. List all your DVBE subcontractors/suppliers. Enter in the appropriate column the dollar amount for each of your subcontractors/suppliers.

C. Enter the total of Lines A and B for each column.

D. Enter the dollar amount of the bid/proposal to be performed by **non**-DVBE firms. Note: This line is the sum of the prime and subcontractor(s) **non**-DVBE dollar participation.

E. Enter the sum of the column totals from Line C and Line D. Note: Please be aware that the final determination of DVBE compliance is made based on the contract amount resulting from the district's acceptance or rejection of alternates.

	BASE BID/PROPOSAL	**ALTERNATE #1**	**ALTERNATE #2**	**ALTERNATE #3 OR BASE BID B**	**ALTERNATE #4 OR BASE BID C**	**ALTERNATE #5** (Modernization or Reconstruction Only)
A. Prime Bidder, *if DVBE (own participation)*	$	$	$	$	$	$
B. DVBE Subcontractor or Supplier						
1.						
2.						
3.						
4.						
C. Subtotal (A & B)						
D. Non-DVBE						
E. Total Bid						

PRIME BIDDER GOOD FAITH EFFORT WORKSHEET

This worksheet is to be used to assist the Prime Bidder in meeting the 3% DVBE participation goal

BIDDER'S NAME	BUSINESS ADDRESS	CONTACT PERSON
TELEPHONE NUMBER	OWNER	COUNTY

GENERAL INSTRUCTIONS:

This worksheet is to be used to assist you in meeting the 3 percent DVBE participation goal. If specific information is not provided for Parts I through III, you do not meet the test of the "Good Faith Effort" and cannot so certify. If you are qualifying based on a "Good Faith Effort" you must include this form with your bid/proposal to the Owner.

PART I – CONTACTS *To identify DVBE subcontractors/suppliers for participation in your bid/proposal, contact must be made with each of the following categories. It is recommended that you contact several DVBE organizations.*

CATEGORY	TELEPHONE NUMBER	DATE CONTACTED	PERSON CONTACTED
1. Owner			
2. Office of Small Business and Disabled Veterans Business Enterprise Services (OSDS). OSDS publishes assistance locating DVBE's at https://www.dgs.ca.gov/PD-OSDS	(916) 375-4940		
3. DVBE Organizations (*List*):			
4. Write "recorded message" in this column, if applicable.			

PART II – ADVERTISEMENTS *You must make at least two (2) advertisements, one (1) in a paper that focuses on DVBE and one (1) in a trade paper. Advertisements should be published at least 14 days prior to bid/proposal opening; if you cannot advertise 14 days prior, advertise as soon as possible and provide an explanation. (Advertisements must be published in time to allow for a reasonable response). Advertisements must include that your firm is seeking DVBE participation, the project name and location, your firm's name, your firm's contact person, and phone number.*

Attach copies of advertisements to this form.

FOCUS/TRADE PAPER NAME	CHECK ONE		DATE OF ADVERTISEMENT
	TRADE	FOCUS	

PART III – DVBE SOLICITATIONS *List DVBE subcontractors/suppliers that were invited to bid. Use the following instructions to complete the remainder of this section (read the three columns as a sentence from left to right). If you need additional space to list DVBE solicitations, please use a separate page and attach to this form.*

IF THE DVBE…..	THEN…..	AND…..
Was selected to participate	Check "yes" in the "SELECTED" column, include the applicable dollar amount in Part III of the Form SAB 515PB	Include a copy of their DVBE letter from OSDS.
Was **not** selected to participate	Check "no" in the "SELECTED" column	State why in the "REASON NOT SELECTED" column.
Did not respond to your solicitation	Check the "NO RESPONSE" column	

DISABLED VETERANS BUSINESS ENTERPRISES CONTACTED	SELECTED		REASON NOT SELECTED *This section must be completed*	NO RESPONSE
	YES	NO		

IMPORTANT NOTE:

Please be aware that certification of the "Good Faith Effort" may only be made if you fully complete Parts I, II, and III on both sides of this form. A copy of this form must be retained by you and may be subject to a future audit.

CERTIFICATION

I, _____ certify that I am the bidder's Chief Executive Officer and that I have made a diligent effort to ascertain the facts with regard to the representations made herein. In making this certification, I am aware of Section 12650 et seq. of the Government Code providing for the imposition of treble damages for making false claims.

SIGNATURE OF CHIEF EXECUTIVE OFFICER	DATE

GENERAL CONDITIONS

for

CONTRACT OF CONSTRUCTION

OF THE

TENAYA MIDDLE SCHOOL SPORTS FIELD RENOVATION
Bid # 2025-4

MERCED CITY SCHOOL DISTRICT

MONTH & YEAR

SUMMARY OF CONTENTS

ARTICLE 1: GENERAL CONDITIONS 1

ARTICLE 2: OWNER 6

ARTICLE 3: THE CONTRACTOR 10

ARTICLE 4: ADMINISTRATION OF THE CONTRACT 25

ARTICLE 5: SUBCONTRACTORS 40

ARTICLE 6: CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS 46

ARTICLE 7: CHANGES IN THE WORK 48

ARTICLE 8: TIME 56

ARTICLE 9: PAYMENTS AND COMPLETION 60

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY 70

ARTICLE 11: INSURANCE AND BONDS 75

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK 80

ARTICLE 13: MISCELLANEOUS PROVISIONS 83

ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT 94

TABLE OF CONTENTS

ARTICLE 1 1
GENERAL CONDITIONS 1
1.1 BASIC DEFINITIONS 1
1.1.1 THE CONTRACT DOCUMENTS 1
1.1.2 THE CONTRACT 1
1.1.3 THE WORK 1
1.1.4 THE PROJECT 2
1.1.5 THE DRAWINGS 2
1.1.6 THE SPECIFICATIONS 2
1.1.7 THE PROJECT MANUAL 2
1.1.8 OR 2
1.1.9 COMPLETION 2
1.2 EXECUTION, CORRELATION AND INTENT 3
1.2.1 CORRELATION AND INTENT 3
1.2.1.1 *Documents Complementary and Inclusive* 3
1.2.1.2 *Coverage of the Drawings and Specifications* 3
1.2.1.3 *Conflicts* 3
1.2.1.4 *Conformance With Laws* 3
1.2.1.5 *Ambiguity* 4
1.2.1.6 *Execution* 4
1.2.2 ADDENDA AND DEFERRED APPROVALS 4
1.2.2.1 *Addenda* 5
1.2.2.2 *Deferred Approvals* 5
1.2.3 SPECIFICATION INTERPRETATION 5
1.2.3.1 *Titles* 5
1.2.3.2 *As Shown, Etc* 5
1.2.3.3 *Provide* 5
1.2.3.4 *General Conditions* 5
1.2.3.5 *Abbreviations* 5
1.2.3.6 *Plural* 5
1.2.3.7 *Metric* 5
1.2.3.8 *Standard Specifications* 5
1.2.3.9 *Absence of Modifiers* 6
1.3 OWNERSHIP AND USE OF ARCHITECT'S DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS 6
ARTICLE 2 6
OWNER 6
2.1 DEFINITION 6
2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER 7
2.2.1 INTENTIONALLY LEFT BLANK 7
2.2.2 SITE SURVEY 7
2.2.3 SOILS 7
2.2.3.1 *Owner Furnished Services* 7
2.2.3.2 *Contractor Reliance* 7
2.2.4 UTILITY SURVEY 8
2.2.5 INFORMATION 8
2.2.6 EXISTING UTILITY LINES; REMOVAL, RELOCATION 8
2.2.6.1 *Removal, Relocation* 8
2.2.6.2 *Assessment* 8
2.2.6.3 *Notification* 8
2.2.6.4 *Underground Utility Clearance* 8
2.2.7 EASEMENTS 9
2.2.8 REASONABLE PROMPTNESS 9
2.2.9 COPIES FURNISHED 9
2.2.10 DUTIES CUMULATIVE 9
2.3 OWNER'S RIGHT TO STOP THE WORK 9
2.4 OWNER'S RIGHT TO CARRY OUT THE WORK 9
ARTICLE 3 10
THE CONTRACTOR 10
3.1 DEFINITION 10
3.2 SUPERVISION AND CONSTRUCTION PROCEDURES 10
3.2.1 CONTRACTOR 10
3.2.2 CONTRACTOR RESPONSIBILITY 11
3.2.3 OBLIGATIONS NOT CHANGED BY ARCHITECT'S ACTIONS 11
3.2.4 CONTRACTOR RESPONSIBILITY FOR READINESS FOR WORK 11
3.2.5 PROJECT MEETINGS 11
3.3 SUPERINTENDENT 11
3.3.1 FULL TIME SUPERINTENDENT 11
3.3.2 STAFF 11
3.3.3 RIGHT TO REMOVE 12
3.4 LABOR AND MATERIALS 12
3.4.1 CONTRACTOR TO PROVIDE 12
3.4.2 QUALITY 12
3.4.3 REPLACEMENT 12
3.4.4 DISCIPLINE 12

3.5 WARRANTY....12
3.6 TAXES....13
3.7 PERMITS, FEES AND NOTICES....13
3.7.1 PAYMENT....13
3.7.2 COMPLIANCE....13
3.7.3 CONTRACT DOCUMENTS....13
3.7.4 RESPONSIBILITY....13
3.8 ALLOWANCES....14
3.8.1 CONTRACT....14
3.8.2 SCOPE....14
3.8.2.1 *Prompt Selection*....14
3.8.2.2 *Cost*....14
3.8.2.3 *Cost Included in Contract Sum*..14
3.8.2.4 *Contract Sum Adjustment*....14
3.9 CONTRACTOR'S CONSTRUCTION SCHEDULES....14
3.9.1 REQUIREMENTS....14
3.9.2 DSA OVERSIGHT PROCESS....17
3.9.3 FAILURE TO MEET REQUIREMENTS....17
3.10 DOCUMENTS AND SAMPLES AT THE SITE....17
3.11 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES....17
3.11.1 SUBMITTALS DEFINED....17
3.11.1.1 *Shop Drawings*....17
3.11.1.2 *Samples*....18
3.11.1.3 *Contractor's Responsibility*....18
3.11.1.4 *Extent of Review*....19
3.11.2 DRAWING SUBMISSION PROCEDURE....19
3.11.2.1 *Transmittal Letter and Other Requirements*....19
3.11.2.2 *Copies Required*....19
3.11.2.3 *Corrections*....19
3.11.2.4 *Approval Prior to Commencement of Work*....20
3.11.3 SAMPLE SUBMISSIONS PROCEDURE....20
3.11.3.1 *Samples Required*....20
3.11.3.2 *Labels and Instructions*....20
3.11.3.3 *Architect's Review*....20
3.11.3.4 *Record Drawings and Annotated Specifications*....20
3.11.3.5 *Equipment Manuals*....21
3.11.3.6 *Owner's Property*....21
3.11.4 SUBSTITUTIONS....21
3.11.4.1 *One Product Specified*....21
3.11.4.2 *Two or More Products Specified*....21
3.11.4.3 *Substitution Request Form*....21
3.11.4.4 *List of Manufacturers and Products Required*....22
3.11.5 DEFERRED APPROVALS....22
3.12 CUTTING AND PATCHING....22
3.12.1 SCOPE....22
3.12.2 CONSENT....22
3.12.3 STRUCTURAL MEMBERS....23
3.12.4 Subsequent Removal....23
3.13 CLEANING UP....23
3.13.1 CONTRACTOR'S RESPONSIBILITY....23
3.13.2 FAILURE TO CLEANUP....23
3.13.3 CONSTRUCTION BUILDINGS....23
3.14 ACCESS TO WORK....24
3.15 ROYALTIES AND PATENTS....24
3.15.1 PAYMENT AND INDEMNITY....24
3.15.2 REVIEW....24
3.16 INDEMNIFICATION....24
3.16.1 SCOPE: CONTRACTOR....24
3.16.2 SCOPE: SUBCONTRACTORS....25
3.16.2.1 *Indemnity*....25
3.16.2.2 *Joint and Several Liability*....26
3.16.3 NO LIMITATION....26
3.17 OWNER AS INTENDED BENEFICIARY....26
3.18 NOTICE OF EXCUSE FOR NONPERFORMANCE....26
ARTICLE 4....27
ADMINISTRATION OF THE CONTRACT 27
4.1 ARCHITECT....27
4.1.1 DEFINITION....27
4.1.2 MODIFICATION....27
4.1.3 TERMINATION....27
4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT....27
4.2.1 STATUS....27
4.2.2 SITE VISITS....27
4.2.3 LIMITATIONS OF CONSTRUCTION RESPONSIBILITY....28
4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION....28
4.2.5 PAYMENT APPLICATIONS....28
4.2.6 REJECTION OF WORK....28
4.2.7 CHANGE ORDERS....28

4.2.8 WARRANTIES UPON COMPLETION 28
4.2.9 INTERPRETATION.....29
4.2.10 ADDITIONAL INSTRUCTIONS 29
4.2.10.1 *Architect's Interpretations and Decisions*.....29
4.2.10.2 *Typical Parts and Sections* 29
4.2.10.3 *Dimensions* 29
4.3 INSPECTOR OF RECORD.....29
4.3.1 GENERAL 29
4.3.2 INSPECTOR OF RECORD'S DUTIES 30
4.3.3 INSPECTOR OF RECORD'S AUTHORITY TO REJECT OR STOP WORK.....30
4.3.4 INSPECTOR OF RECORD'S FACILITIES....30
4.4 RESPONSIBILITY FOR ADDITIONAL CHARGES INCURRED BY THE OWNER FOR PROFESSIONAL SERVICES.....30
4.5 NOTICES OF POTENTIAL CHANGE, CHANGE ORDER REQUESTS, AND CLAIMS.....31
4.5.1 NOTICE OF POTENTIAL CHANGE 31
4.5.2 CHANGE ORDERS REQUESTS.....32
4.5.3 DEFINITION OF CLAIM.....33
4.5.4 TIME FOR SUBMITTING CLAIM; WAIVER 34
4.5.5 CONTENT OF CLAIM 34
4.5.5.1 *Claim Format; Waiver*.....34
4.5.5.2 *Claims for Additional Money*.....36
4.5.5.3 *Claims for Additional Time*.....36
4.5.5.3.1 *Notice of Extent of Claim*.....36
4.5.5.3.2 *Unusually Severe Weather Claims* 36
4.5.5.4 "*Pass Through" Claims*.....37
4.5.6 PROCEDURES FOR CLAIMS LESS THAN OR EQUAL TO $375,000 (PUBLIC CONTRACT CODE SECTION 20104.2).....37
4.5.6.1 *Claims for Less Than $50,000* 37
4.5.6.2 *Claims Over $50,000 and Less Than or equal to $375,000*
Error! Bookmark not defined.
4.5.6.3 *Meet and Confer* 38
4.5.6.4 *Government Code Claim*.....39
4.5.7 PROCEDURES FOR CLAIMS OVER $375,000
Error! Bookmark not defined.
4.5.8 CONTINUING CONTRACT PERFORMANCE 39
4.5.9 CLAIMS FOR CONCEALED OR UNKNOWN CONDITIONS 39
4.5.9.1 *Trenches or Excavations Less Than Four Feet Below the Surface* 39
4.5.9.2 *Trenches or Excavations Greater Than Four Feet Below the Surface* 39
4.5.10 INJURY OR DAMAGE TO PERSON OR PROPERTY 40
ARTICLE 5 41
SUBCONTRACTORS..... 41
5.1 DEFINITIONS 41
5.1.1 SUBCONTRACTOR 41
5.1.2 SUB-SUBCONTRACTOR 41
5.1.3 SPECIALTY CONTRACTORS 41
5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK 41
5.2.1 ASSIGNMENT OR SUBSTITUTION - CONSENT OF OWNER 41
5.2.2 GROUNDS FOR SUBSTITUTION 42
5.2.2.1 *No Change in Contract* 42
5.2.2.2 *Substitution Due to Clerical Error*..... 42
5.3 SUBCONTRACTUAL RELATIONS. 43
5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS..... 44
5.5 SUBCONTRACTOR'S RESPONSIBILITIES 44
5.5.1 SUPERVISION BY SUBCONTRACTORS 44
5.5.2 DISCIPLINE AND ORDER 44
5.5.3 DEFECTS DISCOVERED 44
5.5.4 SUBCONTRACTOR INFORMATION..... 45
5.5.5 TEMPORARY STRUCTURES..... 45
5.5.6 CHARGES TO SUBCONTRACTOR..... 45
5.5.7 FINES IMPOSED..... 45
5.5.8 PROJECT SIGNS..... 45
5.5.9 REMEDIES FOR FAILURE TO PERFORM .. 46
5.5.10 DISPUTES NOT TO AFFECT WORK..... 46
5.5.11 APPLICATION FOR PAYMENT..... 46
5.5.12 COMPLIANCE WITH PROCEDURES..... 46
5.5.13 ON-SITE RECORD KEEPING..... 46
5.5.14 NON-EXCLUSIVE OBLIGATIONS 47
ARTICLE 6..... 47
CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS 47

6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS.....47
6.1.1 OWNER'S RIGHTS.....47
6.1.2 DESIGNATION AS CONTRACTOR.....47
6.1.3 CONTRACTOR DUTIES.....47
6.1.4 OWNER OBLIGATIONS.....48
6.2 MUTUAL RESPONSIBILITY.....48
6.2.1 DELIVERY AND STORAGE.....48
6.2.2 NOTICE BY CONTRACTOR.....48
6.2.3 COSTS INCURRED.....48
6.2.4 CORRECTION OF DAMAGE.....48
6.3 OWNER'S RIGHT TO CLEAN UP.....48
ARTICLE 7.....49
CHANGES IN THE WORK.....49
7.1 CHANGES.....49
7.1.1 NO CHANGES WITHOUT AUTHORIZATION.....49
7.1.2 AUTHORITY TO ORDER MINOR CHANGES.....49
7.2 CHANGE ORDERS ("CO").....50
7.3 CONSTRUCTION CHANGE DIRECTIVES ("CCD").....50
7.3.1 DEFINITION.....50
7.3.2 USE TO DIRECT CHANGE.....50
7.4 REQUEST FOR INFORMATION ("RFI").....50
7.4.1 DEFINITION.....50
7.4.2 SCOPE.....51
7.4.3 RESPONSE TIME.....51
7.4.4 COSTS INCURRED.....51
7.5 REQUEST FOR PROPOSAL ("RFP").....51
7.5.1 DEFINITION.....51
7.5.2 SCOPE.....52
7.6 CHANGE ORDER REQUEST ("COR").....52
7.6.1 DEFINITION.....52
7.6.2 CHANGES IN PRICE.....52
7.6.3 CHANGES IN TIME.....52
7.7 PRICE OF CHANGE ORDERS.....52
7.7.1 SCOPE.....52
7.7.2 DETERMINATION OF COST.....52
7.7.3 FORMAT FOR PROPOSED COST CHANGE.....55
7.7.4 DISCOUNTS, REBATES, AND REFUNDS.....56
7.7.5 ACCOUNTING RECORDS.....56
7.7.6 NOTICE REQUIRED.....56
7.7.7 APPLICABILITY TO SUBCONTRACTORS.....56
7.8 WAIVER OF RIGHT TO CLAIM MONEY OR TIME.....56
ARTICLE 8.....57
TIME.....57
8.1 DEFINITIONS.....57
8.1.1 CONTRACT TIME.....57
8.1.2 NOTICE TO PROCEED.....57
8.1.3 DAYS.....57
8.2 HOURS OF WORK.....57
8.2.1 SUFFICIENT FORCES.....57
8.2.2 PERFORMANCE DURING WORKING HOURS.....57
8.2.3 LABOR CODE APPLICATION.....57
8.2.4 COSTS FOR AFTER HOURS INSPECTIONS.....58
8.2.5 TIME FOR COMMENCEMENT BY SUBCONTRACTORS.....58
8.3 PROGRESS AND COMPLETION.....58
8.3.1 TIME OF THE ESSENCE.....58
8.3.2 NO COMMENCEMENT WITHOUT INSURANCE.....58
8.3.3 EXPEDITIOUS COMPLETION.....59
8.4 EXTENSIONS OF TIME - LIQUIDATED DAMAGES.....59
8.4.1 CONDITIONS ALLOWING FOR EXTENSIONS OF TIME TO COMPLETE THE WORK ONLY (EXCUSABLE DELAY).....59
8.4.2 COMPENSABLE DELAY (TIME AND MONEY).....59
8.4.3 NOTICE BY CONTRACTOR REQUIRED; PROCEDURES FOR DEMANDING ADDITIONAL TIME OR MONEY.....60
8.4.4 EARLY COMPLETION.....60
8.4.5 LIQUIDATED DAMAGES.....60
8.5 GOVERNMENT APPROVALS.....61
ARTICLE 9.....61
PAYMENTS AND COMPLETION.....61
9.1 CONTRACT SUM.....61
9.2 COST BREAKDOWN.....61
9.2.1 REQUIRED INFORMATION.....61
9.2.2 OWNER ACCEPTANCE REQUIRED.....62
9.3 APPLICATIONS FOR PAYMENT.....62
9.3.1 PROCEDURE.....62
9.3.2 PURCHASE OF MATERIALS AND EQUIPMENT.....63
9.3.3 WARRANTY OF TITLE.....63

9.4 REVIEW OF PROGRESS PAYMENT 63
9.4.1 OWNER ACCEPTANCE 63
9.4.2 OWNER'S REVIEW 63
9.5 DECISIONS TO WITHHOLD PAYMENT 64
9.5.1 REASONS TO WITHHOLD PAYMENT 64
9.5.2 PAYMENT AFTER CURE 66
9.5.3 OVERPAYMENT AND/OR FAILURE TO WITHOLD 66
9.6 PROGRESS PAYMENTS 67
9.6.1 PAYMENTS TO CONTRACTOR 67
9.6.2 PAYMENTS TO SUBCONTRACTORS 67
9.6.3 PERCENTAGE OF COMPLETION OR PAYMENT INFORMATION 67
9.6.4 NO OBLIGATION OF OWNER FOR SUBCONTRACTOR PAYMENT 67
9.6.5 PAYMENT TO SUPPLIERS 67
9.6.6 PAYMENT NOT CONSTITUTING APPROVAL OR ACCEPTANCE 68
9.6.7 JOINT CHECKS 68
9.7 COMPLETION OF THE WORK 68
9.7.1 CLOSE-OUT PROCEDURES 68
9.7.2 COSTS OF MULTIPLE INSPECTIONS 69
9.8 PARTIAL OCCUPANCY OR USE 69
9.9 FINAL PROGRESS PAYMENT AND RELEASE OF RETENTION 69
9.9.1 FINAL APPLICATION FOR PROGRESS PAYMENT 69
9.9.2 PROCEDURES FOR APPLICATION FOR FINAL PROGRESS PAYMENT 69
9.9.3 RELEASE OF RETAINAGE 70
9.10 SUBSTITUTION OF SECURITIES 70
ARTICLE 10 71
PROTECTION OF PERSONS AND PROPERTY 71
10.1 SAFETY PRECAUTIONS AND PROGRAMS 71
10.1.1 CONTRACTOR RESPONSIBILITY 71
10.1.2 SUBCONTRACTOR RESPONSIBILITY 71
10.1.3 COOPERATION 72
10.1.4 ACCIDENT REPORTS 72
10.1.5 FIRST-AID SUPPLIES AT SITE 72
10.2 SAFETY OF PERSONS AND PROPERTY 72
10.2.1 THE CONTRACTOR 72
10.2.2 CONTRACTOR NOTICES 72
10.2.3 SAFETY BARRIERS AND SAFEGUARDS 72
10.2.4 USE OR STORAGE OF HAZARDOUS MATERIAL 73
10.2.5 FINGERPRINTING 73
10.3 PROTECTION OF WORK AND PROPERTY 73
10.3.1 PROTECTION OF WORK 73
10.3.2 PROTECTION FOR ELEMENTS 73
10.3.3 SHORING AND STRUCTURAL LOADING 73
10.3.4 CONFORMANCE WITHIN ESTABLISHED LIMITS 74
10.3.5 SUBCONTRACTOR ENFORCEMENT OF RULES 74
10.3.6 SITE ACCESS 74
10.3.7 PROTECTION OF MATERIALS 74
10.4 EMERGENCIES 74
10.4.1 EMERGENCY ACTION 74
10.4.2 ACCIDENT REPORTS 74
10.5 HAZARDOUS MATERIALS 75
10.5.1 DISCOVERY OF HAZARDOUS MATERIALS 75
10.5.2 HAZARDOUS MATERIAL WORK LIMITATIONS 75
10.5.3 INDEMNIFICATION BY OWNER FOR HAZARDOUS MATERIAL NOT CAUSED BY CONTRACTOR 75
10.5.4 INDEMNIFICATION BY CONTRACTOR FOR HAZARDOUS MATERIAL CAUSED BY CONTRACTOR 76
10.5.5 TERMS OF HAZARDOUS MATERIAL PROVISION 76
10.5.6 ARCHEOLOGICAL MATERIALS 76
ARTICLE 11 76
INSURANCE AND BONDS 76
11.1 CONTRACTOR'S LIABILITY INSURANCE 76
11.1.1 LIABILITY INSURANCE REQUIREMENTS 76
11.1.2 SUBCONTRACTOR INSURANCE REQUIREMENTS 77
11.1.3 OWNER'S INSURANCE 78
11.1.4 ADDITIONAL INSURED ENDORSEMENT REQUIREMENTS 78
11.1.5 WORKERS' COMPENSATION INSURANCE 78

11.1.6 BUILDER'S RISK/"ALL RISK" INSURANCE 79
11.1.6.1 COURSE-OF-CONSTRUCTION INSURANCE REQUIREMENTS 79
11.1.7 CONSENT OF INSURER FOR PARTIAL OCCUPANCY OR USE 79
11.1.8 FIRE INSURANCE 79
11.1.9 OTHER INSURANCE 80
11.1.10 PROOF OF CARRIAGE OF INSURANCE 80
11.1.11 COMPLIANCE 80
11.2 PERFORMANCE AND PAYMENT BONDS 81
11.2.1 BOND REQUIREMENTS 81
11.2.2 SURETY QUALIFICATION 81
ARTICLE 12 81
UNCOVERING AND CORRECTION OF WORK 81
12.1 UNCOVERING OF WORK 81
12.1.1 UNCOVERING WORK FOR REQUIRED INSPECTIONS 81
12.1.2 COSTS FOR INSPECTIONS NOT REQUIRED 81
12.2 CORRECTION OF WORK; WARRANTY 82
12.2.1 CORRECTION OF REJECTED WORK 82
12.2.2 REMOVAL OF NONCONFORMING WORK 82
12.2.3 OWNER'S RIGHTS IF CONTRACTOR FAILS TO CORRECT 82
12.2.4 COST OF CORRECTING THE WORK 82
12.2.5 WARRANTY CORRECTIONS (INCLUDES REPLACEMENT) 83
12.2.6 NO TIME LIMITATION 83
12.3 NONCONFORMING WORK AND WITHHOLDING THE VALUE OF IT 83
ARTICLE 13 83
MISCELLANEOUS PROVISIONS 83
13.1 GOVERNING LAW 83
13.2 SUCCESSORS AND ASSIGNS 84
13.3 WRITTEN NOTICE 84
13.4 RIGHTS AND REMEDIES 84
13.4.1 DUTIES AND OBLIGATIONS CUMULATIVE 84
13.4.2 NO WAIVER 84
13.5 TESTS AND INSPECTIONS 84
13.5.1 COMPLIANCE 84
13.5.2 INDEPENDENT TESTING LABORATORY 84
13.5.3 ADVANCE NOTICE TO INSPECTOR OF RECORD 85
13.5.4 TESTING OFF-SITE 85
13.5.5 ADDITIONAL TESTING OR INSPECTION 85
13.5.6 COSTS FOR RETESTING 85
13.5.7 COSTS FOR PREMATURE TEST 85
13.5.8 TESTS OR INSPECTIONS NOT TO DELAY WORK 86
13.6 [INTENTIONALLY LEFT BLANK] . 86
13.7 TRENCH EXCAVATION 86
13.7.1 TRENCHES GREATER THAN FIVE FEET 86
13.7.2 EXCAVATION SAFETY 86
13.7.3 NO TORT LIABILITY OF OWNER 86
13.7.4 NO EXCAVATION WITHOUT PERMITS. 86
13.8 WAGE RATES 86
13.8.1 WAGE RATES 86
13.8.2 HOLIDAY AND OVERTIME PAY 87
13.8.3 WAGE RATES NOT AFFECTED BY SUBCONTRACTS 87
13.8.4 CHANGE IN PREVAILING WAGE DURING BID OR CONSTRUCTION 87
13.8.5 FORFEITURE AND PAYMENTS 87
13.8.6 MINIMUM WAGE RATES 88
13.8.7 PER DIEM WAGES 88
13.8.8 POSTING OF WAGE RATES 88
13.9 RECORD OF WAGES PAID: INSPECTION 88
13.9.1 APPLICATION OF LABOR CODE 88
13.10 APPRENTICES 90
13.10.1 APPRENTICE WAGES AND DEFINITIONS 90
13.10.2 APPRENTICE LABOR POOL 90
13.10.3 JOURNEYMAN/APPRENTICE RATIO; COMPUTATION OF HOURS 91
13.10.4 JOURNEYMAN/APPRENTICE RATIO 91
13.10.4.1 *Apprenticeable Craft or Trade* .. 92
13.10.5 RATIO EXEMPTION 92
13.10.6 APPRENTICE FUND 92
13.10.7 PRIME CONTRACTOR COMPLIANCE 93
13.10.8 DECISIONS OF JOINT APPRENTICESHIP COMMITTEE 93
13.10.9 NO BIAS 93

13.10.10 VIOLATION OF LABOR CODE.....93
13.11 ASSIGNMENT OF ANTITRUST CLAIMS.....94
13.11.1 APPLICATION 94
13.11.2 ASSIGNMENT OF CLAIM 94
13.12 AUDIT 94
13.13 STORM WATER DISCHARGE PERMIT 95
ARTICLE 14 95
TERMINATION OR SUSPENSION OF THE CONTRACT.....95
14.1 TERMINATION BY THE CONTRACTOR FOR CAUSE 95
14.2 TERMINATION BY THE OWNER FOR CAUSE 96
14.2.1 GROUNDS FOR TERMINATION 96
14.2.2 NOTIFICATION OF TERMINATION 96
14.2.3 PAYMENTS WITHHELD 96
14.2.4 PAYMENTS UPON COMPLETION 97
14.2.5 INCLUSION OF TERMINATION FOR CONVENIENCE..... 97
14.3 SUSPENSION OR TERMINATION BY THE OWNER FOR CONVENIENCE..... 97
14.3.1 SUSPENSION BY OWNER 97
14.3.1.1 *Adjustments* 97
14.3.1.2 *Adjustments for Fixed Cost* 97
14.3.2 TERMINATION BY THE OWNER FOR CONVENIENCE..... 97
14.4 NOT A WAIVER 98
14.5 MUTUAL TERMINATION FOR CONVENIENCE..... 98
14.6 EARLY TERMINATION 98

ARTICLE 1

GENERAL CONDITIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The "Contract Documents" consist of the Agreement between Owner and Contractor (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, addenda issued prior to bid, Instructions to Bidders, Notice to Bidders, the Bid Form, Bid Bond, Performance Bond, Payment Bond, required insurance certificates, additional insured endorsement and declarations page, Designation of Subcontractors, Noncollusion Declaration, Roof Project Certification (where applicable), Iran Contracting Act Certification, Sufficient Funds Declaration (Labor Code section 2810) and the Fingerprinting Notice and Acknowledgment and Independent Contractor Student Contact Form, Workers' Compensation Certificaiton, Drug-free Workplace Certificaiton, Notice Regarding Russia-Related Sanctions, DVBE Certificate, DVBE Prime Bidder Worksheet, other documents referred to in the Agreement, and Modifications issued after execution of the Agreement. A Modification is a written amendment to the Contract signed by both parties, a Change Order, a Construction Change Directive, or a written order for a minor change in the Work issued by the Owner. The Contract Documents are complementary, and each obligation of the Contractor, Subcontractors, material or equipment suppliers in any one shall be binding as if specified in all.

1.1.2 THE CONTRACT

The Contract Documents form the Contract. The "Contract" represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a written Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind between the Architect and Contractor, between the Owner and any Subcontractor or Sub-subcontractor, or between any persons or entities other than the Owner and the Contractor. The terms of the Contract shall not be waived, altered, modified, supplemented or amended in any manner whatsoever except by written agreement signed by the parties and approved or ratified by the Governing Board.

1.1.3 THE WORK

The "Work" shall include all labor, materials, services and equipment necessary for the Contractor to fulfill all of its obligations pursuant to the Contract Documents, including but not limited to punch list items and submission of documents. It shall include the initial obligation of any Contractor or Subcontractor, who performs any portion of the Work, to visit the Site of the proposed Work with Owner's representatives, a continuing obligation after the commencement of the Work to fully acquaint and familiarize itself with the conditions as they exist and the character of the operations to be carried on under the Contract Documents, and make such investigation as it may see fit so that it shall fully understand the facilities, physical conditions,

and restrictions attending the Work under the Contract Documents. Each such Contractor or Subcontractor shall also thoroughly examine and become familiar with the Drawings, Specifications, and associated bid documents. ***The "Site" refers to*** the grounds of the Project as defined in the Contract Documents and such adjacent lands as may be directly affected by the performance of the Work. The Work shall constitute a "work of improvement" under Civil Code section 8050 and Public Contract Code section 7107.

1.1.4 THE PROJECT

The "Project" is the total construction of the Work performed in accordance with the Contract Documents, but "Project" may also include construction by the Owner or by separate contractors.

1.1.5 THE DRAWINGS

The "Drawings" are graphic and pictorial portions of the Contract Documents prepared for the Project and approved changes thereto, wherever located and whenever issued, showing the design, location, and scope of the Work, generally including plans, elevations, sections, details, schedules, and diagrams as drawn or approved by the Architect.

1.1.6 THE SPECIFICATIONS

The "Specifications" are that portion of the Contract Documents consisting of the written requirements for material, equipment, construction systems, instructions, quality assurance standards, workmanship, and performance of related services.

1.1.7 THE PROJECT MANUAL

The "Project Manual" is the volume usually assembled for the Work which may include, without limitation, the bidding requirements, sample forms, Agreement, Conditions of the Contract, and Specifications.

1.1.8 OR

"Or" shall include "and/or."

1.1.9 COMPLETION

Statutory definitions of "Completion" and "Complete" shall apply for those statutory purposes. For all other purposes, including accrual of liquidated damages, Claims, and warranties, "Completion" and "Complete" mean the point in the Work where (1) Contractor has fully and correctly performed all Work in all parts and requirements, including corrective and punch list work, and (2) Owner's representatives have conducted a final inspection that confirmed this performance. Substantial, or any other form of partial or non-compliant, performance shall not constitute "Completion" or "Complete."

1.1.10 ***COMPLETION* OF THE PROJECT**

For purposes of accrual of liquidated damages for delay to the Project, *completion* shall mean the point in the Project where (1) all contractors and Owner have fully and correctly performed all work of the entire Project in all parts and requirements, including corrective and punch list work, and (2) Owner's representatives have conducted a final inspection of the entire Project that confirmed this performance. Substantial, or any other form of partial or non-compliant, performance shall not constitute *completion* or *complete*.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 CORRELATION AND INTENT

1.2.1.1 ***Documents Complementary and Inclusive.*** The Contract Documents are complementary and are intended to include all items required for the proper execution and Completion of the Work. Any item of Work mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, shall be provided by Contractor as if shown or mentioned in both.

1.2.1.2 ***Coverage of the Drawings and Specifications.*** The Drawings and Specifications generally describe the work to be performed by Contractor. Generally, the Specifications describe work which cannot be readily indicated on the Drawings and indicate types, qualities, and methods of installation of the various materials and equipment required for the Work. It is not intended to mention every item of Work in the Specifications, which can be adequately shown on the Drawings, or to show on the Drawings all items of Work described or required by the Specifications even if they are of such nature that they could have been shown. All materials or labor for Work, which is shown on the Drawings or the Specifications (or is reasonably inferable therefrom as being necessary to Complete the Work), shall be provided by the Contractor whether or not the Work is expressly covered in the Drawings or the Specifications. It is intended that the Work be of sound, quality construction, and the Contractor shall be responsible for the inclusion of adequate amounts to cover installation of all items indicated, described, or implied in the portion of the Work to be performed by Contractor.

1.2.1.3 ***Conflicts.*** Without limiting Contractor's obligation to identify conflicts for resolution by the Owner, it is intended that the more stringent, higher quality, and greater quantity of Work shall apply.

1.2.1.4 ***Conformance With Laws.*** Each and every provision of law 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 application of either party the Contract shall be amended in writing to make such insertion or correction.

Before commencing any portion of the Work, Contractor shall check and review the Drawings and Specifications for such portion for conformance and compliance with all laws,

ordinances, codes, rules and regulations of all governmental authorities and public utilities affecting the construction and operation of the physical plant of the Project, all quasi-governmental and other regulations affecting the construction and operation of the physical plant of the Project, and other special requirements, if any, designated in the Contract Documents. In the event Contractor observes any violation of any law, ordinance, code, rule or regulation, or inconsistency with any such restrictions or special requirements of the Contract Documents, Contractor shall promptly notify Architect and Owner in writing of same and shall ensure that any such violation or inconsistency shall be corrected in the manner provided hereunder prior to the construction of that portion of the Work. Where requirements of the Contract Documents exceed those of the applicable building codes and ordinances, the Contract Documents shall govern. Contractor shall comply with all applicable Federal, State and local laws.

If, as and to the extent that Public Contract Code section 1104 is deemed to apply after the award of the Contract, Contractor shall not be required to assume responsibility for the completeness and accuracy of architectural or engineering plans and specifications, notwithstanding any other provision in the Contract Documents, except to the extent that Contractor discovered or should have discovered and reported any errors and omissions to the Architect and Owner, including but not limited to as the result of any review of the plans and specifications by Contractor required by the Instructions to Bidders or other Contract Documents, whether or not actually performed by Contractor.

1.2.1.5 ***Ambiguity.*** Before commencing any portion of the Work, Contractor shall carefully examine all Drawings and Specifications and other information given to Contractor as to materials and methods of construction and other Project requirements. Contractor shall immediately notify Architect and Owner in writing of any perceived or alleged error, inconsistency, ambiguity, or lack of detail or explanation in the Drawings and Specifications in the manner provided herein. If the Contractor or its Subcontractors, material or equipment suppliers, or any of their officers, agents, and employees performs, permits, or causes the performance of any Work under the Contract Documents, which it knows or should have known to be in error, inconsistent, or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all costs arising therefrom including, without limitation, the cost of correction thereof without increase or adjustment to the Contract Sum or the time for performance. If Contractor performs, permits, or causes the performance of any Work under the Contract Documents prepared by or on behalf of Contractor which is in error, inconsistent or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all resulting costs, including, without limitation, the cost of correction, without increase to or adjustment in the Contract Sum or the time for performance. In no case shall any Subcontractor proceed with the Work if uncertain without the Contractor's written direction and/or approval.

1.2.1.6 ***Execution.*** Execution of the Agreement Between Owner and Contractor by the Contractor is a representation that the Contractor has visited the Site, become familiar with the local conditions under which the Work is to be performed and has correlated personal observations with the requirements of the Contract Documents.

1.2.2 ADDENDA AND DEFERRED APPROVALS

1.2.2.1 ***Addenda.*** Subsequent addenda issued shall govern over prior addenda only to the extent specified. In accordance with Title 24, California Code of Regulations, addenda shall be approved by the Division of the State Architect ("DSA").

1.2.2.2 ***Deferred Approvals.*** The requirements approved by the DSA on any item submitted as a deferred approval in accordance with Title 24, California Code of Regulations, shall take precedence over any previously issued addenda, drawing or specification.

1.2.3 **SPECIFICATION INTERPRETATION**

1.2.3.1 ***Titles.*** The Specifications are separated into titled sections for convenience only and not to dictate or determine the trade or craft involved. Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of work to be performed by any trade.

1.2.3.2 ***As Shown, Etc.*** Where "as shown," "as indicated," "as detailed," or words of similar import are used, reference is made to the Drawings accompanying the Specifications unless otherwise stated. Where "as directed," "as required," "as permitted," "as authorized," "as accepted," "as selected," or words of similar import are used, the direction, requirement, permission, authorization, approval, acceptance, or selection by Architect is intended unless otherwise stated.

1.2.3.3 ***Provide.*** "Provide" means "provided complete in place," that is, furnished, installed, tested, and ready for operation and use.

1.2.3.4 ***General Conditions.*** The General Conditions and any supplementary general conditions are a part of each and every section of the Specifications.

1.2.3.5 ***Abbreviations.*** In the interest of brevity, the Specifications are written in an abbreviated form and may not include complete sentences. Omission of words or phrases such as "Contractor shall," "shall be," etc., are intentional. Nevertheless, the requirements of the Specifications are mandatory. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings.

1.2.3.6 ***Plural.*** Words in the singular shall include the plural whenever applicable or the context so indicates.

1.2.3.7 ***Metric.*** The Specifications may indicate metric units of measurement as a supplement to U.S. customary units. When indicated thus: 1" (25 mm), the U. S. customary unit is specific, and the metric unit is nonspecific. When not shown with parentheses, the unit is specific. The metric units correspond to the "International System of Units" (SI) and generally follow ASTM E 380, "Standard for Metric Practice."

1.2.3.8 ***Standard Specifications.*** Any reference to standard specifications of any society, institute, association, or governmental authority is a reference to the organization's

standard specifications, which are in effect as of the date the Notice to Bidders is first published. If applicable specifications are revised prior to completion of any part of the Work, the Contractor may, if acceptable to Owner and Architect, perform such Work in accordance with the revised specifications. The standard specifications, except as modified in the Specifications for the Project, shall have full force and effect as though printed in the Specifications. Architect will furnish, upon request, information as to how copies of the standard specifications referred to may be obtained.

1.2.3.9 ***Absence of Modifiers.*** In the interest of brevity, the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

1.3 OWNERSHIP AND USE OF ARCHITECT'S DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS

The Drawings, Specifications, and other documents prepared on behalf of the Owner are instruments of the services of the Architect and its consultants and are the property of the Owner. The Contractor may retain one contract record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor, or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications, and other documents prepared by the Architect, and unless otherwise indicated the Architect shall be deemed the author of them. All copies of them, except the Contractor's record set, shall be returned or suitably accounted for to the Owner, upon request upon Completion of the Work. The Drawings, Specifications, and other documents prepared by the Architect, and copies thereof furnished to the Contractor, are for use solely with respect to this Contract. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor, or material or equipment supplier on other contracts or projects or for additions to this Contract or Project outside the scope of the Work without the specific written consent of the Owner and the Architect. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications, and other documents prepared by the Architect appropriate to and for use in the execution of their Work under the Contract Documents. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Owner's property interest or other reserved right. All copies made under this license shall bear appropriate attribution and the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect.

ARTICLE 2

OWNER

2.1 DEFINITION

The term "Owner" means the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the

Owner and/or the Owner's authorized representatives, including but not limited to architects and construction managers. To the extent the Contract Documents indicate that Owner has assigned duties to particular representatives of the Owner (such as the Architect, or any construction manager), Owner reserves the right at all times to reassign such duties to different Owner representatives.

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 INTENTIONALLY LEFT BLANK

2.2.2 SITE SURVEY

When required by the scope of the Work, the Owner will furnish, at its expense, a legal description or a land survey of the Site, giving, as applicable, grades and lines of streets, alleys, pavements, adjoining property, rights-of-way, restrictions, easements, encroachments, zoning, deed restrictions, boundaries, and contours of the Site. Surveys to determine locations of construction, grading, and Site work shall be provided by the Contractor.

2.2.3 SOILS

2.2.3.1 ***Owner Furnished Services.*** When required by the scope of the Project, the Owner will furnish, at its expense, the services of geotechnical engineers or consultants when reasonably required or as required by local or state codes. Such services with reports and appropriate professional recommendations shall include test boring, test pits, soil bearing values, percolation tests, air and water pollution tests, and ground corrosion and resistivity tests, including necessary operations for determining subsoil, air, and water conditions.

2.2.3.2 ***Contractor Reliance.*** Test borings and soils reports for the Project have been made for the Owner to indicate the subsurface materials that might be encountered at particular locations on the Project. The Owner has made these documents available to the Contractor and the Contractor has studied the results of such test borings and information that it has as to the subsurface conditions and Site geology as set forth in the test borings and soils reports. The Owner does not assume any responsibility whatsoever with respect to the sufficiency or accuracy of the borings made, or of the logs of the test borings, or of other investigations, or of the soils reports furnished pursuant hereto, or of the interpretations to be made beyond the location or depth of the borings. There is no warranty or guarantee, either express or implied that the conditions indicated by such investigations, borings, logs, soil reports or other information are representative of those existing throughout the Site of the Project, or any part thereof, or that unforeseen developments may not occur. At the Owner's request, the Contractor shall make available to the Owner the results of any Site investigation, test borings, analyses, studies or other tests conducted by or in the possession of the Contractor of any of its agents. Nothing herein contained shall be deemed a waiver by the Contractor to pursue any available legal right or remedy it may have at any time against any third party who may have prepared any report and/or test relied upon by the Contractor.

2.2.4 UTILITY SURVEY

When required by the scope of the Project, the Owner will furnish, at its expense, all information regarding known existing utilities on or adjacent to the Site, including location, size, inverts, and depths.

2.2.5 INFORMATION

Upon the request of the Contractor, Owner will make available such existing information regarding utility services and Site features, including existing construction, related to the Project as is available from Owner's records. The Contractor may not rely upon the accuracy of any such information, other than that provided under Sections 2.2.2 and 2.2.4 (except that the Contractor may not rely upon, and must question in writing to the Owner and the Architect, any information which appears incorrect based upon Contractor's Site inspection, knowledge of the Work and Project, and prior experience with similar projects), unless specifically stated in writing that the Contractor may rely upon the designated information.

2.2.6 EXISTING UTILITY LINES; REMOVAL, RELOCATION

2.2.6.1 ***Removal, Relocation.*** Pursuant to Government Code section 4215, the Owner assumes the responsibility for removal, relocation, and protection of utilities located on the Site at the time of commencement of construction under this Contract with respect to any such utility facilities which are not identified in the drawings and specifications made part of the invitation to bid. The Contractor shall not be assessed for liquidated damages for delay in Completion of the Work caused by failure of the Owner to provide for removal or relocation of such utility facilities. Owner shall compensate the Contractor for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, removing or relocating such utility facilities, and for equipment necessarily idle during such work.

2.2.6.2 ***Assessment.*** These subparagraphs shall not be construed to preclude assessment against the Contractor for any other delays in Completion of the Work. Nothing in these subparagraphs shall be deemed to require the Owner to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the Site can be inferred from the presence of other visible facilities, such as buildings, or meter junction boxes on or adjacent to the Site.

2.2.6.3 ***Notification.*** If the Contractor, while performing work under this Contract, discovers utility facilities not identified by the Owner in the Contract plans or specifications, Contractor shall immediately notify the Owner and the utility in writing.

2.2.6.4 ***Underground Utility Clearance.*** It shall be Contractor's sole responsibility to timely notify all public and private utilities serving the Site prior to commencing work. The Contractor shall notify and receive clearance from any cooperative agency, such as Underground Service Alert, in accordance with Government Code section 4216, et seq. Contractor shall promptly provide a copy of all such notifications to the Owner.

2.2.7 **EASEMENTS**

Owner shall secure and pay for easements for permanent structures or permanent changes in existing facilities, if any, unless otherwise specified in the Contract or Contract Documents.

2.2.8 **REASONABLE PROMPTNESS**

Information or services under Owner's control will be furnished by the Owner with reasonable promptness. The Owner shall not be liable for any delays caused by factors beyond the Owner's control including but not limited to DSA's or any other local, State or federal agency's review of bids, change order requests, RFI's or any other documents.

2.2.9 **COPIES FURNISHED**

The Contractor will be furnished such copies of Drawings and Project Manuals as are stated in the Contract Documents.

2.2.10 **DUTIES CUMULATIVE**

The foregoing are in addition to other duties and responsibilities of the Owner enumerated herein, and especially those in Article 6 (Construction by Owner or by Separate Contractors), Article 9 (Payments and Completion), and Article 11 (Insurance and Bonds).

2.3 **OWNER'S RIGHT TO STOP THE WORK**

If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents, or persistently fails to carry out Work in accordance with the Contract Documents, the Owner, after providing Notice pursuant to Section 2.4, may order the Contractor to stop the Work or any portion thereof, until the Contractor corrects the deficiencies. The right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Article 6.

2.4 **OWNER'S RIGHT TO CARRY OUT THE WORK**

If the Contractor fails or refuses to carry out the Work in accordance with the Contract Documents, Owner may correct such deficiencies by whatever reasonable method the Owner may deem expedient without prejudice to other remedies the Owner may have, including but not limited to having another contractor perform some or all of the Work without terminating the Contract with Contractor. Owner may exercise this right at any time during the Contractor's Work.

Owner shall first provide written notice to Contractor of Contractor's failure or refusal to perform. The notice will provide the time period within which Contractor must begin correction of the failure or refusal to perform. If the Contractor fails to begin correction within the stated time, or fails to continue correction, the Owner may proceed to correct the deficiencies. In the

event the Owner bids the work, Contractor shall not be eligible for the award of the contract. The Contractor may be invoiced the cost to Owner of the work, including compensation for additional professional and internally generated services and expenses made necessary by Contractor's failure or refusal to perform. Owner may withhold that amount from the retention, or progress payments due the Contractor, pursuant to Section 9.5. If retention and payments withheld then or thereafter due the Contractor are not sufficient to cover that amount, the Contractor shall pay the difference to the Owner.

ARTICLE 3

THE CONTRACTOR

3.1 DEFINITION

The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative. To the extent that any portion of the Work is provided with the Contractor's own forces, any reference to Subcontractors shall be equally applicable to the Contractor.

3.2 SUPERVISION AND CONSTRUCTION PROCEDURES

3.2.1 CONTRACTOR

The Contractor shall supervise and direct the Work using the Contractor's best skill and attention, which shall meet or exceed the standards in the industry. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, procedures, and coordinating all portions of the Work under the Contract, unless Contract Documents give other specific instructions concerning these matters.

Owner shall schedule and coordinate the activities of Contractor with the other contractors and Owner. Contractor agrees to accept the Owner's construction schedules, schedule updates, overall sequence and coordination of construction for the Project.

Contractor realizes that work by other contractors or Owner may occur simultaneously with Contractor's Work in any given area. Contractor is responsible for its own sequences that may occur within a given activity or set of activities. Contractor shall not commit or permit any act which will adversely affect the work of any other contractor or Owner. Contractor shall provide layout of its Work at the request of any other contractor or Owner.

Specific duties of the Contractor shall be in accordance with Title 24 of the California Code of Regulations. Contractor shall fully comply with any and all reporting requirements of Education Code sections 17309 and 81141 in the manner prescribed by Title 24.

3.2.2 CONTRACTOR RESPONSIBILITY

The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors, material and equipment suppliers, and their agents, employees, invitees, and other persons performing portions of the Work under direct or indirect contract with the Contractor or any of its Subcontractors.

3.2.3 OBLIGATIONS NOT CHANGED BY OTHER'S ACTIONS

The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents by the activities or duties of the Owner's representatives, including but not limited to any construction manager and the Architect, or the Inspector of Record; or by tests, inspections, or approvals required or performed by persons other than the Contractor.

3.2.4 CONTRACTOR RESPONSIBILITY FOR READINESS FOR WORK

The Contractor shall be responsible for inspection of Work already performed under the Contract Documents to determine that such portions are in proper condition to receive subsequent work.

3.2.5 PROJECT MEETINGS

During its Work, Contractor shall attend Owner's Project meetings as scheduled by the Contract Documents, or as otherwise instructed by Owner, to discuss the current status of the Work and Project, and the future progress of the Work and the Project. Contractor shall have five (5) days after receipt of Owner's Project meeting minutes to provide written objections and suggested corrections.

3.3 SUPERINTENDENT

3.3.1 FULL TIME SUPERINTENDENT

The Contractor shall provide a competent superintendent and assistants as necessary, all of whom shall be reasonably proficient in speaking, reading and writing English and, who shall be in attendance at the Project Site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

3.3.2 STAFF

The Contractor and each Subcontractor shall: furnish a competent and adequate staff as necessary for the proper administration, coordination, supervision, and superintendence of its portion of the Work; organize the procurement of all materials and equipment so that the materials and equipment will be available at the time they are needed for the Work; and keep an adequate force of skilled workers on the job to Complete the Work in accordance with all requirements of the Contract Documents.

3.3.3 RIGHT TO REMOVE

Owner shall have the right, but not the obligation, to require the removal from the Project of any superintendent, staff member, agent, or employee of any Contractor, Subcontractor, material or equipment supplier, etc., for cause.

3.4 LABOR AND MATERIALS

3.4.1 CONTRACTOR TO PROVIDE

Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, material, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and Completion of the Work whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

3.4.2 QUALITY

Unless otherwise specified, all materials and equipment to be permanently installed in the Project shall be new and shall be of such quality as required to satisfy the standards of the Contract Documents. The Contractor shall, if requested, promptly furnish satisfactory evidence as to kind and quality of all materials and equipment. All labor shall be performed by workers skilled in their respective trades, and the quality of their work shall meet whichever is the higher standard for their work: the standard in the industry or the standard in the Contract Documents.

3.4.3 REPLACEMENT

Any work, materials, or equipment, which does not conform to these standards may be disapproved and rejected by the Owner, in which case, they shall be removed and replaced by the Contractor at no cost to the Owner.

3.4.4 DISCIPLINE

The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract in accordance with paragraph 5.5.1 including, but not limited to, Subcontractors, and material or equipment suppliers retained for the Project.

3.5 WARRANTY

For the period of one (1) year after Completion of the Work (see Sections 9.7.1, 12.2.5, and 12.2.6), the Contractor warrants to the Owner that material and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty does not cover 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 required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

3.6 TAXES

Contractor will pay all applicable Federal, State, and local taxes on all materials, labor, or services furnished by it, and all taxes arising out of its operations under the Contract Documents. Owner is exempt from Federal Excise Tax, and a Certificate of Exemption shall be provided upon request.

3.7 PERMITS, FEES AND NOTICES

3.7.1 PAYMENT

The Contractor shall secure and pay for all permits and governmental fees, licenses, and inspections necessary for proper execution and Completion of the Work which are customarily secured after execution of the Contract and are legally required by any authority having jurisdiction over the Project, except those required by the Division of the State Architect (DSA). Owner shall be responsible for all testing and inspection as required by the DSA on-Site or within the distance limitations set forth in paragraph 13.5.2, unless a different mileage range is specified in the Contract Documents.

3.7.2 COMPLIANCE

The Contractor shall comply with and give notices required by any law, ordinance, rule, regulation, and lawful order of public authorities bearing on performance of the Work.

3.7.3 CONTRACT DOCUMENTS

It is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with any applicable law, statute, ordinance, building codes, rule, or regulation. However, if the Contractor knew, or should have known, or observes that portions of the Contract Document are at variance therewith, the Contractor shall promptly notify the Architect, any construction manager, and Owner in writing, and necessary changes shall be accomplished by appropriate modification.

3.7.4 RESPONSIBILITY

If the Contractor performs any work that it knows, or should have known, is contrary to any law, statute, ordinance, building code, rule or regulation, the Contractor shall assume full responsibility for such work, and shall bear the attributable cost of correction and delays to the Work, other contractors' work, and the Project.

3.8 ALLOWANCES

3.8.1 CONTRACT

The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities against whom the Contractor makes reasonable and timely objection.

3.8.2 SCOPE

3.8.2.1 ***Prompt Selection.*** Materials and equipment under an allowance shall be selected promptly by the Owner to avoid delay to the Work.

3.8.2.2 ***Cost.*** Allowances shall cover the cost to the Contractor of materials and equipment delivered at the Site and all required taxes, less applicable trade discounts, etc., as delineated in paragraph 7.7.4.

3.8.2.3 ***Cost Included in Contract Sum.*** Contractor's costs for unloading and handling at the Site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum and not in the allowances.

3.8.2.4 ***Contract Sum Adjustment.*** Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect the difference between actual cost and the allowances under paragraph 3.8.2.2 and the change in the Contractor's costs under paragraph 3.8.2.3.

3.9 CONTRACTOR'S CONSTRUCTION SCHEDULES

3.9.1 REQUIREMENTS

Before the Contractor's commencement of Work or within two (2) weeks of award of the Contract, whichever is earlier, Contractor shall prepare and submit for the Owner's, and any construction manager's, information the baseline construction schedule for the Work, which shall conform to the Contract Documents' requirements.

Contractor shall submit a monthly updated schedule of the Work that will include an accurate as-built schedule and the current as-planned schedule, both of which shall conform to the Contract Documents' requirements. Contractor shall submit its daily logs for the prior month with the updated schedule.

The schedule and updates shall conform, at a minimum, to industry standards for (a) critical path scheduling and (b) facilitation of Owner's Project management and evaluation of Contractor Claims for additional money or time.

The schedule and updates shall not exceed time limits (including milestone deadlines) under the Contract Documents and shall comply with the Contract Documents scheduling requirements and with any scheduling requirements the Owner provides to the Contractor at the beginning of the Work. The original schedule and all updates shall accurately reflect work performed to date, all construction tasks (including procurement), the critical path schedule for Completion of the remainder of the Work, and the percentage of the Work completed. The original schedule and updates shall include all delay days for weather not unusually severe, even though that weather will not entitle Contractor to additional time or money.

The construction schedule shall be in the form of either a tabulation, chart, or graph, unless otherwise stated in Division 1 of the Specifications, and shall be in sufficient detail to show the chronological relationship of all activities of the Project including, but not limited to, estimated starting and completion dates of various activities, (including early and late dates and reasonable float for each activity), procurement of materials, the critical path, and scheduling of equipment. Float suppression techniques such as preferential sequencing, special lead/lag logic restraints, extended activity durations, or imposed dates shall be apportioned for the benefit of the Project. Whenever in the Contract Documents Contractor is required to provide a schedule and/or schedule updates, the Contractor shall provide the schedule and updates in electronic format as well as hard copy. Contractor shall be solely responsible for the accuracy, utility and reasonableness of all of its schedules. Owner's acceptance, approval or non-rejection of Contractor's schedules shall not affect Contractor's responsibility for its schedules.

The Contractor and Owner shall use any float on a "first come, first served" basis. The original schedule and updates shall reflect Contractor's and Owner's use of float. Float is not for the exclusive use or benefit of either Owner or Contractor, but it is a jointly owned expiring Project resource available to both parties as needed to meet schedule milestones. For the original schedule and updates, Contractor shall use a critical path network format with the critical paths clearly indicated. Contractor shall use an MS Project, Primavera, or an equivalent or better program. Contractor shall include reports that sort and list the activities in order of increasing float and by early and late start dates. Contractor shall endeavor to label ten to thirty percent (10-30%) of the tasks as critical, but shall not label less than five (5%) or more than fifty (50%) as critical. Contractor shall use calendar days.

If any change in Contractor's method of operations will cause a change in the construction schedule, Contractor shall submit to Owner, Architect, and any construction manager, a revised construction schedule within seven (7) days of the change, unless a different time period is stated in Division 1 of the Specifications.

If, in the Owner's opinion, the Contractor is not prosecuting the Work at a rate sufficient to meet the Work schedule or a contractual milestone, or to Complete the Work within the Contract Time as adjusted by change orders, or if the Contractor's actual progress falls behind the Work schedule or it is apparent to Owner that Contractor will not meet contractual milestones or Complete the Work within the Contract Time as adjusted by change orders, the Owner may require that the Contractor prepare and submit a recovery plan. Contractor must submit a recovery plan within seven (7) days of a demand for the plan, unless a different time period is stated in Division 1 of the Specifications. At a minimum, the recovery plan must include a

revised schedule that gets the Work back on schedule and Completes all Work by the contractual milestones and within the Contract Time as adjusted by change orders or by other dates Owner specifies in the demand for a recovery plan. The recovery plan shall state the corrective actions Contractor will undertake to implement it. The recovery plan shall also list any additional money that Contractor believes it should receive if Owner orders Contractor to fully or partially implement the recovery plan. If the Owner orders Contractor to implement the recovery plan, Contractor shall do so, but the order shall not act constitute an admission by Owner that Contractor is entitled to additional money. To recover additional money, Contractor must comply with General Conditions Articles 4.5, 7 and 8.

All schedules Contractor submits shall be certified as true and correct, as follows:

> I, _____ *[name of declarant]*, declare the following:
>
> _____ *[Contractor company name]* has contracted with _____ *[public entity name]* for the _____ Contract ("Contract"). _____ *[Contractor company name]* authorized me to prepare schedules for _____ *[public entity name]* for this Project, and I prepared the attached schedule. I am the most knowledgeable person at _____ *[Contractor company name]* regarding the scheduling of the Work for this Contract.
>
> The attached schedule does not breach the Contract between _____ *[Contractor company name]* and _____ *[public entity name]* for this Project, does not violate any applicable law, satisfies all provisions of the Contract applicable to submission of schedules, only contains truthful and accurate as-built and as-planned dates of the Work (including supporting data), and is not a false claim.
>
> The attached schedule is submitted in compliance with all laws applicable to submission of a Claim, including but not limited to California Penal Code section 72 (Fraudulent Claims), Government Code sections 12650 et seq. (False Claims Act; for example, Government Code section 12651(a)(7)), and Business and Professions Code sections 17200 et seq. (Unfair Business Practices Act). I am aware that submission or certification of false claims, or other Claims that violate law or the Contract, may lead to fines, imprisonment, and/or other serious legal consequences for myself and/or _____ *[Contractor company name]*.
>
> While preparing this declaration and schedule I consulted with others (including attorneys, consultants, or others who work for _____ *[Contractor company name]*) when necessary to ensure that the statements were true and correct.

I declare under the penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed _____, 20__, at _____, California.

_____ *[signature]*
_____ *[name of declarant]*

3.9.2 DSA OVERSIGHT PROCESS

In connection with the DSA Construction Oversight Process which includes inspection cards and review of changes to the DSA-approved construction documents, the Contractor must (a) include specific tasks in its baseline schedule to take into account these procedures since they are critical path issues; and (b) include a reasonable amount of float in the baseline schedule to accommodate the additional time required by these DSA procedures.

3.9.3 FAILURE TO MEET REQUIREMENTS

Failure of the Contractor to provide proper schedules may, at the sole discretion of Owner, constitute either grounds to withhold, in whole or in part, progress payments to the Contractor, or a breach of contract allowing Owner to terminate the Contract.

3.10 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the Site for the Owner one applicable copy of Titles 19 and 24 and record copy of the Drawings, Specifications, Addenda, Change Orders, and other Modifications, in good order and marked currently to record changes and selections made during construction. In addition, the Contractor shall maintain at the Site approved Shop Drawings,

Product Data, Samples, and similar required submittals. These documents shall be available to the Owner and shall be delivered to the Owner, or the Architect for delivery to the Owner, upon Completion of the Work.

3.11 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

3.11.1 SUBMITTALS DEFINED

3.11.1.1 ***Shop Drawings.*** The term "shop drawings" as used herein means drawings, diagrams, schedules, and other data, which are prepared by Contractor, Subcontractors, manufacturers, suppliers, or distributors illustrating some portion of the Work, and includes: illustrations; fabrication, erection, layout and setting drawings; manufacturer's standard drawings; schedules; descriptive literature, instructions, catalogs, and brochures; performance and test data including charts; wiring and control diagrams; and all other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment, or systems and their position conform to the requirements of the Contract Documents. The Contractor shall obtain and submit with the shop drawings all seismic and other calculations and all product data

from equipment manufacturers. "Product data" as used herein are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product, or system for some portion of the Work. As used herein, the term "manufactured" applies to standard units usually mass-produced, and "fabricated" means items specifically assembled or made out of selected materials to meet individual design requirements. Shop drawings shall: establish the actual detail of all manufactured or fabricated items, indicate proper relation to adjoining work, amplify design details of mechanical and electrical systems and equipment in proper relation to physical spaces in the structure, and incorporate minor changes of design or construction to suit actual conditions.

3.11.1.2 ***Samples.*** The term "samples" as used herein are physical examples furnished by Contractor to illustrate materials, equipment, or quality and includes natural materials, fabricated items, equipment, devices, appliances, or parts thereof as called for in the Specifications, and any other samples as may be required by the Owner to determine whether the kind, quality, construction, finish, color, and other characteristics of the materials, etc., proposed by the Contractor conform to the required characteristics of the various parts of the Work. All Work shall be in accordance with the approved samples.

3.11.1.3 ***Contractor's Responsibility.*** Contractor shall obtain and shall submit to Architect all required shop drawings and samples in accordance with Contractor's "Schedule for Submission of Shop Drawings and Samples" provisions in Division 1 of the Specifications and in accordance with the Contractor's original and updated schedules, and with such promptness as to cause no delay in its own Work or in that of any other contractor, Owner or subcontractor but in no event later than ninety (90) days after the execution of the Agreement. Contractor may be assessed $100 a day for each day it is late in submitting a shop drawing or sample. No extensions of time will be granted to Contractor or any Subcontractor because of its failure to have shop drawings and samples submitted in accordance with the Schedule. Each Subcontractor shall submit all shop drawings, samples, and manufacturer's descriptive data for the review of the Owner, the Contractor, and the Architect through the Contractor. By submitting shop drawings, product data, and samples, the Contractor or submitting party (if other than Contractor) represents that it has determined and verified all materials, field measurements, field conditions, catalog numbers, related field construction criteria, and other relevant data in connection with each such submission, and that it has checked, verified, and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. At the time of submission, any deviation in the shop drawings, product data, or samples from the requirements of the Contract Documents shall be narratively described in a transmittal accompanying the submittal. However, submittals shall not be used as a means of requesting a substitution, the procedure for which is defined in paragraph 3.11.4, "Substitutions." Review by Owner and Architect shall not relieve the Contractor or any Subcontractor from its responsibility in preparing and submitting proper shop drawings in accordance with the Contract Documents. Contractor shall stamp, sign, and date each submittal indicating its representation that the submittal meets all of the requirements of the Contract Documents. Any submission, which in Owner's or Architect's opinion is incomplete, contains numerous errors, or has been checked only superficially by Contractor will be returned unreviewed for resubmission by the Contractor.

3.11.1.4 ***Extent of Review.*** In reviewing shop drawings, the Owner will not verify dimensions and field conditions. The Architect will review and approve shop drawings, product data, and samples for aesthetics and for conformance with the design concept of the Work and the information given in the Contract Documents. The Architect's review shall neither be construed as a complete check nor relieve the Contractor, Subcontractor, manufacturer, fabricator, or supplier from responsibility for any deficiency that may exist or from any departures or deviations from the requirements of the Contract Documents unless the Contractor has, in writing, called the Architect's attention to the deviations at the time of submission and the Architect has given specific written approval. The Architect's review shall not relieve the Contractor or Subcontractors from responsibility for errors of any sort in shop drawings or schedules, for proper fitting of the Work, or from the necessity of furnishing any Work required by the Contract Documents, which may not be indicated on shop drawings when reviewed. Contractor and Subcontractors shall be solely responsible for determining any quantities, whether or not shown on the shop drawings.

3.11.2 **DRAWING SUBMISSION PROCEDURE**

3.11.2.1 ***Transmittal Letter and Other Requirements.*** All shop drawings must be properly identified with the name of the Contract and Contractor's name and dated, and each lot submitted must be accompanied by a letter of transmittal referring to the name of the Contract and Contractor and to the Specification section number for identification of each item clearly stating in narrative form, as well as "clouding" on the submissions, all qualifications, departures, or deviations from the Contract Documents, if any. Shop drawings, for each section of the Work, shall be numbered consecutively, and the numbering system shall be retained throughout all revisions. All Subcontractor submissions shall be made through the Contractor. Each drawing shall have a clear space for the stamps of Architect and Contractor. Only shop drawings required to be submitted by the Contract Documents shall be reviewed.

3.11.2.2 ***Copies Required.*** Each submittal shall include one (1) legible, reproducible sepia and five (5) legible prints of each drawing, including fabrication, erection, layout and setting drawings, and such other drawings as required under the various sections of the Specifications until final acceptance thereof is obtained. Subcontractor shall submit copies, in an amount as requested by the Contractor, of: manufacturers' descriptive data for materials, equipment, and fixtures, including catalog sheets showing dimensions, performance, characteristics, and capacities; wiring diagrams and controls; schedules; all seismic calculations and other calculations; and other pertinent information as required.

3.11.2.3 ***Corrections.*** The Contractor shall make any corrections required by Architect and shall resubmit as required by Architect the required number of corrected copies of shop drawings or new samples until approved. Contractor shall direct specific attention in writing or on resubmitted shop drawings to revisions other than the corrections required by the Architect on previous submissions. Professional services required for more than one (1) re-review of required submittals of shop drawings, product data, or samples are subject to charge to the Contractor pursuant to paragraph 4.4.

3.11.2.4 ***Approval Prior to Commencement of Work.*** No portion of the Work requiring a shop drawing or sample submission shall be commenced until the submission has been reviewed by Owner and approved by Architect unless specifically directed in writing by the Owner. All such portions of the Work shall be in accordance with approved shop drawings and samples.

3.11.3 **SAMPLE SUBMISSIONS PROCEDURE**

3.11.3.1 ***Samples Required.*** In case a considerable range of color, graining, texture, or other characteristics may be anticipated in finished products, a sufficient number of samples of the specified materials shall be furnished by the Contractor to indicate the full range of characteristics, which will be present in the finished products; and products delivered or erected without submittal and approval of full range samples shall be subject to rejection. Except for range samples, and unless otherwise called for in the various sections of the Specifications, samples shall be submitted in duplicate. All samples shall be marked, tagged, or otherwise properly identified with the name of the submitting party, the name of the Contract, the purpose for which the samples are submitted, and the date and shall be accompanied by a letter of transmittal containing similar information, together with the Specification section number for identification of each item. Each tag or sticker shall have clear space for the review stamps of Contractor and Architect.

3.11.3.2 ***Labels and Instructions.*** Samples of materials, which are generally furnished in containers bearing the manufacturers' descriptive labels and printed application instructions, shall, if not submitted in standard containers, be supplied with such labels and application instructions.

3.11.3.3 ***Architect's Review.*** The Architect will review and, if appropriate, approve submissions and will return them to the Contractor with the Architect's stamp and signature applied thereto, indicating the appropriate action in compliance with the Architect's standard procedures.

3.11.3.4 ***Record Drawings and Annotated Specifications.*** The Contractor will prepare and maintain on a current basis an accurate and complete set of Record Drawings showing clearly all changes, revisions, and substitutions during construction, including, without limitation, field changes and the final location of all mechanical equipment, utility lines, ducts, outlets, structural members, walls, partitions, and other significant features, and Annotated Specifications showing clearly all changes, revisions, and substitutions during construction. A copy of such Record Drawings and Annotated Specifications will be delivered to Owner in accordance with the schedule prepared by Contractor. In the event of a specification that allows Contractor to elect one of several brands, makes, or types of material or equipment, the annotations shall show which of the allowable items the Contractor has furnished. The Contractor will update the Record Drawings and Annotated Specifications as often as necessary to keep them current but no less often than weekly. The Record Drawings and Annotated Specifications shall be kept at the Site and available for inspection by the Owner, Inspector of Record and the Architect. On Completion of the Contractor's Work and prior to Application for Final Progress Payment, the Contractor will provide one complete set of Record Drawings and

Annotated Specifications to the Owner, certifying them to be a complete and accurate reflection of the actual construction conditions of the Work.

3.11.3.5 ***Equipment Manuals.*** Contractor shall obtain and furnish to the Owner three (3) complete sets of manuals containing the manufacturers' instructions for maintenance and operation of each item of equipment and apparatus furnished under the Contract Documents and any additional data specifically requested under the various sections of the Specifications for each division of the Work. The manuals shall be arranged in proper order, indexed, and placed in three-ring binders. At the Completion of its Work, the Contractor shall certify, by endorsement thereon, that each of the manuals is complete, accurate, and covers all of its Work. Prior to submittal of Contractor's Application for Final Progress Payment, and as a further condition to its approval by the Architect, each Subcontractor shall deliver the manuals, arranged in proper order, indexed, endorsed, and placed in three-ring binders, to the Contractor, who shall assemble these manuals for all divisions of the Work, review them for completeness, and submit them to the Owner through the Architect.

3.11.3.6 ***Owner's Property.*** All shop drawings and samples submitted shall become the Owner's property.

3.11.4 **SUBSTITUTIONS**

3.11.4.1 ***One Product Specified.*** Unless the Specifications state that no substitution is permitted, whenever in the Contract Documents any specific article, device, equipment, product, material, fixture, patented process, form, method, or type of construction is indicated or specified by name, make, trade name, or catalog number, with or without the words "or equal," such specification shall be deemed to be used for the purpose of facilitating description of material, process, or article desired and shall be deemed to be followed by the words "or equal." Contractor may, unless otherwise stated, offer any material, process, or article, which shall be substantially equal or better in every respect to that so indicated or specified and will completely accomplish the purpose of the Contract Documents.

3.11.4.2 ***Two or More Products Specified.*** When two or more acceptable products are specified for an item of the Work, the choice will be up to the Contractor. Contractor shall utilize the same product throughout the Project. If a timely substitution request as set forth in Section 3.11.4.3 is not provided and an "or equal" substitution is requested, the Owner may consider the substitution if the product specified is no longer commercially available. If the Owner allows the substitution to be proposed pursuant to such an untimely request, the Contractor will be responsible for the professional fees incurred by the Architect or Architect's consultants in reviewing the proposed substitution which fees may be withheld from progress payments and/or retention.

3.11.4.3 ***Substitution Request Form.*** Requests for substitutions of products, materials, or processes other than those specified must be made on the Substitution Request form available from the Owner prior to the date of the bid opening. Any Requests submitted less than fourteen (14) days prior to the date of the bid opening will not be considered, except as noted in paragraph 3.11.4.2. A Substitution Request must be accompanied by evidence as to whether or not the

proposed substitution: is equal in quality and serviceability to the specified item; will entail no changes in detail and construction of related work; will be acceptable in consideration of the required design and artistic effect; will provide no cost disadvantage to Owner; and will require no excessive or more expensive maintenance, including adequacy and availability of replacement parts. The burden of proof of these facts shall be upon the Contractor. The Contractor shall furnish with its request sufficient information to determine whether the proposed substitution is equivalent including but not limited to all drawings, specifications, samples, performance data, calculations, and other information as may be required to assist the Architect and the Owner in determining whether the proposed substitution is acceptable. The final decision shall be the Owner's. The written approval of the Owner, consistent with the procedure for Change Orders, shall be required for the use of a proposed substitute material. Owner may condition its approval of the substitution upon delivery to Owner of an extended warranty or other assurances of adequate performance of the substitution. All risks of delay due to the Division of the State Architect's approval, or the approval of any other governmental agency having jurisdiction, of a requested substitution shall be on the requesting party.

3.11.4.4 ***List of Manufacturers and Products Required.*** The Subcontractor shall prepare and submit to the Contractor within thirty (30) days of execution of the Subcontract comprehensive lists, in quadruplicate, of the manufacturers and products proposed for the Project, including information on materials, equipment, and fixtures required by the Contract Documents, as may be required for Contractor's or Architect's preliminary approval. Approval of such lists of products shall not be construed as a substitute for the shop drawings, manufacturer's descriptive data, and samples, which are required by the Contract Documents, but rather as a base from which more detailed submittals shall be developed for the final review of the Contractor and the Architect.

3.11.5 DEFERRED APPROVALS

Deferred approvals shall be submitted and processed pursuant to the requirements of Division 1 of the Specifications. All risks of delay due to the Division of the State Architect's, or any other governmental agency having jurisdiction, approval of a deferred approval shall be on the requesting party.

3.12 CUTTING AND PATCHING

3.12.1 SCOPE

The Contractor shall be responsible for cutting, fitting, or patching required to Complete the Work or to make its parts fit together properly.

3.12.2 CONSENT

The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or a separate contractor by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and

of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work. All cutting shall be done promptly, and all repairs shall be made as necessary.

3.12.3 STRUCTURAL MEMBERS

New or existing structural members and elements, including reinforcing bars and seismic bracing, shall not be cut, bored, or drilled except by written authority of the Architect. Work done contrary to such authority is at the Contractor's risk, subject to replacement at its own expense and without reimbursement under the Contract. Agency approvals shall be obtained by the Architect, not by the Contractor.

3.12.4 SUBSEQUENT REMOVAL

Permission to patch any areas or items of the Work shall not constitute a waiver of the Owner's or the Architect's right to require complete removal and replacement of the areas of items of the Work if, in the opinion of the Architect or the Owner, the patching does not satisfactorily restore quality and appearance of the Work or does not otherwise conform to the Contract Documents. Any costs caused by defective or ill-timed cutting or patching shall be borne by the person or entity responsible.

3.13 CLEANING UP

3.13.1 CONTRACTOR'S RESPONSIBILITY

The Contractor shall keep the Site and surrounding area free from accumulation of waste material or rubbish caused by operations under the Contract. The Site shall be maintained in a neat and orderly condition. All crates, cartons, paper, and other flammable waste materials shall be removed from Work areas and properly disposed of at the end of each day. The Contractor shall continuously remove from and about the Site the waste materials, rubbish, tools, construction equipment, machinery, and materials no longer required for the Work.

3.13.2 FAILURE TO CLEANUP

If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so, without prior notice to the Contractor and the cost thereof shall be invoiced to the Contractor and withheld from progress payments and/or retention. Each Subcontractor shall have the responsibility for the cleanup of its own Work. If the Subcontractor fails to clean up, the Contractor must do so.

3.13.3 CONSTRUCTION BUILDINGS

When directed by the Owner or the Architect, Contractor and Subcontractor shall dismantle temporary structures, if any, and remove from the Site all construction and installation equipment, fences, scaffolding, surplus materials, rubbish, and supplies belonging to Contractor

or Subcontractor. If the Contractor does not remove the tools, equipment, machinery, and materials within fifteen (15) days after Completion of its Work, then they shall be deemed abandoned, and the Owner can dispose of them for its own benefit in whatever way it deems appropriate. Contractor shall pay for any costs to dispose of the items.

3.14 ACCESS TO WORK

The Contractor shall provide the Owner, the Architect, and the Inspector of Record, access to the Work in preparation and progress wherever located.

3.15 ROYALTIES AND PATENTS

3.15.1 PAYMENT AND INDEMNITY

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims of infringement of patent rights and shall hold the Owner and the Architect harmless and indemnify them, to the extent not caused by the Owner's active negligence, sole negligence or willful misconduct, from loss on account thereof but shall not be responsible for such defense or loss when a particular design, process, or product of a particular manufacturer is required by the Contract Documents. However, if the Contractor has reason to believe the required design, process, or product is an infringement of a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Owner and Architect.

3.15.2 REVIEW

The review by the Owner or Architect of any method of construction, invention, appliance, process, article, device, or material of any kind shall be for its adequacy for the Work and shall not be an approval for the use by the Contractor in violation of any patent or other rights of any person or entity.

3.16 INDEMNIFICATION

3.16.1 SCOPE: CONTRACTOR

To the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Owner, any construction manager, Architect, Architect's consultants, the Inspector of Record, the State of California, and their respective agents, employees, officers, volunteers, Boards of Trustees, members of the Boards of Trustees, and directors ("Indemnitees"), from and against claims, actions, damages, liabilities, losses (including but not limited to injury or death of persons, property damage, and compensation owed to other parties), and expenses (including but not limited to attorneys' fees and costs including fees of consultants) alleged by third parties against Indemnitees arising out of or resulting from the following: Contractor's, its Subcontractors', or its suppliers' performance of the Work, including but not limited to the Contractor's or its Subcontractors' use of the Site; the Contractor's or its Subcontractors' construction of the Project, or failure to construct the Project, or any portion thereof; the use, misuse, erection, maintenance, operation, or failure of any machinery or equipment including,

but not limited to, scaffolds, derricks, ladders, hoists, and rigging supports, whether or not such machinery or equipment was furnished, rented, or loaned by any of the Indemnitees; or any act, omission, negligence, or willful misconduct of the Contractor or its Subcontractors or their respective agents, employees, material or equipment suppliers, invitees, or licensees but only to the extent caused in whole or in part by the acts or omissions of the Contractor, its Subcontractors, its suppliers, anyone directly or indirectly employed by any of them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity, which would otherwise exist as to a party, person, or entity described in this paragraph. The obligation to defend, indemnify and hold harmless includes any claims or actions by third parties arising out of or resulting from Labor Code section 2810. Contractor shall have no obligation to defend or indemnify the Indemnitees against claims, actions, damages, liabilities, losses, and expenses caused by the active negligence, sole negligence or willful misconduct of Indemnitees. This indemnification shall apply to all liability, as provided for above, regardless of whether any insurance policies are applicable, and insurance policy limits do not act as a limitation upon the amount of the indemnification to be provided by the Contractor.

3.16.2 **SCOPE: SUBCONTRACTORS**

3.16.2.1 ***Indemnity.*** The Subcontractors shall defend, indemnify, and hold harmless the Indemnitees from and against claims, actions, damages, liabilities, and losses (including but not limited to injury or death of persons, property damage, and compensation owed to other parties), and expenses (including but not limited to attorneys' fees and costs including fees of consultants) alleged by third parties against Indemnitees arising out of or resulting from the following: Subcontractors' performance of the Work, including but not limited to the Subcontractors' use of the Site; the Subcontractors' construction of the Project or failure to construct the Project or any portion thereof; the use, misuse, erection, maintenance, operation, or failure of any machinery or equipment, including, but not limited to, scaffolds, derricks, ladders, hoists, and rigging supports, whether or not such machinery or equipment was furnished, rented, or loaned by any of the Indemnitees; or any act, omission, negligence, or willful misconduct of the Subcontractors or their respective agents, employees, material or equipment suppliers, invitees, or licensees but only to the extent caused in whole or in part by the acts or omissions of the Subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity, which would otherwise exist as to a party, person, or entity described in this paragraph. This obligation to defend, indemnify and hold harmless includes any claims or actions by third parties arising out of or resulting from Labor Code section 2810. Subcontractors shall have no obligation to defend or indemnify the Indemnitees against claims, actions, damages, liabilities, losses, and expenses caused by the active negligence, sole negligence or willful misconduct of Indemnitees. This indemnification shall apply to all liability, as provided for above, regardless of whether any insurance policies are applicable, and insurance policy limits do not act as a limitation upon the amount of the indemnification to be provided by the Subcontractors.

3.16.2.2 ***Joint and Several Liability.*** In the event more than one Subcontractor is connected with an accident or occurrence covered by this indemnification, then all such Subcontractors shall be jointly and severally responsible to each of the Indemnitees for indemnification, and the ultimate responsibility among such indemnifying Subcontractors for the loss and expense of any such indemnification shall be resolved without jeopardy to any Indemnitee. The provisions of the indemnity provided for herein shall not be construed to indemnify any Indemnitee for its own negligence if not permitted by law or to eliminate or reduce any other indemnification or right which any Indemnitee has by law or equity.

3.16.3 **NO LIMITATION**

The Contractor's and the Subcontractor's obligation to indemnify and defend the Indemnitees hereunder shall include, without limitation, any and all claims, damages, and costs: for injury to persons and property (including loss of use), and sickness, disease or death of any person; for breach of any warranty, express or implied; for failure of the Contractor or the Subcontractor to comply with any applicable governmental law, rule, regulation, or other requirement; and for products installed in or used in connection with the Work.

3.17 OWNER AS INTENDED BENEFICIARY

The Owner is an intended beneficiary of any architectural or engineering work secured by, or performed by, the Contractor to fulfill its obligations under the Contract. Contractor shall state in its contracts with architectural or engineering consultants that their work is for the intended benefit of the Owner.

3.18 NOTICE OF EXCUSE FOR NONPERFORMANCE

If Contractor believes that acts or omissions of Owner (including but not limited to Owner caused delay) have prevented Contractor from performing the Work as required by the Contract Documents and Contractor intends to rely on Owner's acts or omissions and Civil Code section 1511(1) as reasons to excuse Contractor's nonperformance or to support, among other things, Contractor's requests for time extensions under section 4.5, below, Contractor shall provide written notice of the excuse within five (5) days of the Owner's acts or omissions. If Contractor fails to timely submit the written notice, Contractor shall have waived any right to later rely on the acts or omissions as a defense to Contractor's nonperformance or as the basis for a time extension, regardless of the merits of the defense or time extension. Contractor will not have satisfied a condition precedent or exhausted administrative remedies. Contractor acknowledges that these written notices are of critical importance to the Owner's management of the Work and Project and the mitigation of costs and delays to the Work and Project.

ARTICLE 4

ADMINISTRATION OF THE CONTRACT

4.1 ARCHITECT

4.1.1 DEFINITION

The Architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Architect" means the Architect or the Architect's authorized representative, and shall also refer to all consultants under the Architect's direction and control.

4.1.2 MODIFICATION

To the extent the Contract Documents indicate that Owner has assigned duties or responsibilities to the Architect, Owner reserves the right at all times to reassign such duties or responsibilities to different Owner representatives.

4.1.3 TERMINATION

In the case of the termination of the Architect, the Owner may appoint an architect or another construction professional or may perform such functions with its own licensed professional personnel. The status of the replacement Architect under the Contract Documents shall be that of the former architect.

4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT

4.2.1 STATUS

The Architect will provide administration of the Contract and may be one of several Owner's representatives during construction, through release of all retention, and during the one (1) year period following the commencement of any warranties. The Architect will advise and consult with the Owner. The Architect will have authority to act on behalf of the Owner only to the extent set forth in the Owner/Architect agreement. The Architect will have all responsibilities and power established by law, including California Code of Regulations, Title 24, to the extent set forth in the Owner/Architect agreement.

4.2.2 SITE VISITS

The Architect will visit the Site at intervals necessary in the judgment of the Architect or as otherwise agreed by the Owner and the Architect in writing to become generally familiar with the progress and quality of the completed Work and to determine in general if the Work is being performed in a manner indicating that the Work, when Completed, will be in accordance with the

Contract Documents.

4.2.3 LIMITATIONS OF CONSTRUCTION RESPONSIBILITY

The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract Documents, or by tests, inspections, or approvals required or performed by persons other than the Contractor.

4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

The Owner and the Contractor shall communicate through the Architect, unless there is a construction manager for the Project or the Owner directs otherwise. Communications between Owner and Subcontractors or material or equipment suppliers shall be through the Contractor.

4.2.5 PAYMENT APPLICATIONS

The Contractor shall submit payment applications to the Architect, unless there is a construction manager for the Project or the Owner directs otherwise.

4.2.6 REJECTION OF WORK

The Architect, Inspector of Record, any construction manager and others may recommend to the Owner that the Owner reject Work which does not conform to the Contract Documents or that the Owner require additional inspection or testing of the Work in accordance with paragraph 13.5.5, whether or not the Work is fabricated, installed, or completed. However, no recommendation shall create a duty or responsibility to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons performing portions of the Work.

4.2.7 CHANGE ORDERS

The Architect will prepare change orders and construction change directives and may authorize minor changes in the Work.

4.2.8 WARRANTIES UPON COMPLETION

The Architect in conjunction with the Inspector of Record, or as otherwise directed by Owner, will conduct field reviews of the Work to determine the date of Completion, shall receive and forward to the Owner for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor. The handling by the Architect of such warranties, maintenance manuals, or similar documents shall not diminish or transfer to the Architect any responsibilities or liabilities required by the Contract Documents of the Contractor or other entities, parties, or persons performing or supplying the Work.

Except as may be otherwise directed by Owner, the Architect will conduct a field review of the Contractor's comprehensive list of items to be completed or corrected for development of a punch list and one (1) follow-up field review if required. The cost incurred by the Owner for further field reviews or the preparation of further punch lists by the Architect shall be invoiced to the Contractor and withheld from payment and/or retention.

4.2.9 INTERPRETATION

The Architect, Inspector of Record, any construction manager, the Owner or any independent consultant of Owner, as Owner deems appropriate, will interpret and decide matters concerning performance under and requirements of the Contract Documents on written request of the Contractor. The Owner's response to such requests will be made with reasonable promptness, while allowing sufficient time to permit adequate review and evaluation of the request.

4.2.10 ADDITIONAL INSTRUCTIONS

4.2.10.1 ***Architect's Interpretations and Decisions.*** Interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. When making such interpretations of and decisions regarding the Contract Documents, the Architect will endeavor to secure faithful performance under the Contract Documents by both the Owner and the Contractor and will not show partiality to either. The Work shall be executed in conformity with, and the Contractor shall do no work without, approved drawings, Architect's clarifying instructions, and/or submittals.

4.2.10.2 ***Typical Parts and Sections.*** Whenever typical parts or sections of the Work are completely detailed on the Drawings, and other parts or sections which are essentially of the same construction are shown in outline only, the complete details shall apply to the Work which is shown in outline.

4.2.10.3 ***Dimensions.*** Dimensions of Work shall not be determined by scale or rule. Figured dimensions shall be followed at all times. If figured dimensions are lacking on Drawings, Architect shall supply them on request. The Owner's decisions on matters relating to aesthetic effect will be final if consistent with the Contract Documents.

4.3 INSPECTOR OF RECORD

4.3.1 GENERAL

One or more Project inspectors ("Inspector of Record") employed by the Owner and approved by the Division of the State Architect will be assigned to the Work in accordance with the requirements of Title 24 of the California Code of Regulations. The Inspector of Record's duties will be as specifically defined in Title 24.

4.3.2 INSPECTOR OF RECORD'S DUTIES

All Work shall be under the observation of or with the knowledge of the Inspector of Record. The Inspector of Record shall have free access to any or all parts of the Work at any time. The Contractor shall furnish the Inspector of Record such information as may be necessary to keep the Inspector of Record fully informed regarding progress and manner of work and character of materials. Such observations shall not, in any way, relieve the Contractor from responsibility for full compliance with all terms and conditions of the Contract, or be construed to lessen to any degree the Contractor's responsibility for providing efficient and capable superintendence. The Inspector of Record is not authorized to make changes in the drawings or specifications nor shall the Inspector of Record's approval of the Work and methods relieve the Contractor of responsibility for the correction of subsequently discovered defects, or from its obligation to comply with the Contract Documents.

4.3.3 INSPECTOR OF RECORD'S AUTHORITY TO REJECT OR STOP WORK

The Inspector of Record shall have the authority to reject work that does not comply with the provisions of the Contract Documents. In addition, the Inspector of Record may stop any work which poses a probable risk of harm to persons or property. The Contractor shall instruct its employees, Subcontractors, material and equipment suppliers, etc., accordingly. The absence of any Stop Work order or rejection of any portion of the Work shall not relieve the Contractor from any of its obligations pursuant to the Contract Documents.

4.3.4 INSPECTOR OF RECORD'S FACILITIES

Within seven (7) days after notice to proceed, the Contractor shall provide the Inspector of Record with the temporary facilities as required under Division 1 of the Specifications.

4.4 RESPONSIBILITY FOR ADDITIONAL CHARGES INCURRED BY THE OWNER FOR PROFESSIONAL SERVICES

If at any time prior to the Completion of the requirements under the Contract Documents, through no fault of its own, the Owner is required to provide or secure additional professional services for any reason by any act or omission of the Contractor, the Contractor shall be invoiced by the Owner for any actual costs incurred for any such additional services, which costs may, among other remedies, be withheld from the progress payments and/or retention. Such invoicing shall be independent from any other Owner remedies, including but not limited to liquidated damages. If payments then or thereafter due to the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. Additional services shall include, but shall not be limited to, the following:

A. Services made necessary by the default of the Contractor.

B. Services made necessary due to the defects or deficiencies in the Work of the Contractor.

C. Services required by failure of the Contractor to perform according to any provision of the Contract Documents.

D. Services in connection with evaluating substitutions of products, materials, equipment, Subcontractors proposed by the Contractor, and making subsequent revisions to drawings, specifications, and providing other documentation required (except for the situation where the specified item is no longer manufactured or available).

E. Services for evaluating and processing Claims submitted by the Contractor in connection with the Work outside the established Change Order process.

F. Services required by the failure of the Contractor to prosecute the Work in a timely manner in compliance within the specified time for Completion.

G. Services in conjunction with the testing, adjusting, balancing and start-up of equipment other than the normal amount customarily associated for the type of Work involved.

H. Services in conjunction with more than one (1) re-review of required submittals of shop drawings, product data, and samples.

4.5 NOTICES OF POTENTIAL CHANGE, CHANGE ORDER REQUESTS, AND CLAIMS

If the Contractor identifies the potential for extra work, delay in the critical path schedule, or the need for additional money or time, or if the Contractor requests additional money or time, or if the Contractor believes that Owner has failed to pay amounts due or otherwise breached the Contract, or otherwise believes that it is entitled to a modification of the Contract terms and conditions, then Contractor shall follow the procedures in this Section 4.5 and Article 7, otherwise Contractor shall have waived its rights to pursue those issues and any later attempts to recover money or obtain a modification shall be barred. Contractor specifically acknowledges the Owner's and public's interest in, and need to know of, potential changes and disputes as early as possible so Owner can investigate, mitigate and resolve adverse cost and time impacts, if any. It is Contractor's obligation to know and comply with the requirements of Section 4.5 and Article 7, and Owner has no obligation to notify Contractor of any failure to comply with those requirements.

4.5.1 NOTICE OF POTENTIAL CHANGE

Contractor shall submit a written Notice of Potential Change for extra work, critical path delay, or additional money or time. Contractor shall submit written Notices of Potential Change to Owner within five (5) days of Contractor becoming aware of the issues creating the potential for change, unless the issues are, or may soon be, adversely affecting the costs or critical path of the Work, in which case the Contractor must submit the written notice without delay so the Owner may take immediate action to mitigate cost and schedule impacts of the change, if any. The

written notice shall explain the nature of the potential change so the Owner may take action to mitigate costs and schedule impacts, if necessary.

When submitting a written Notice of Potential Change based on extra work, Contractor shall not perform the extra work until directed in writing to do so by Owner. When submitting a written Notice of Potential Change for an issue of critical path delay, Contractor shall proactively mitigate the effects of the alleged delay as much as reasonably possible so as to minimize any impact to the schedule, until otherwise directed by Owner. If Contractor intends to rely on Owner's acts or omissions in support of a request for a time extension, then Contractor must also provide the notice set forth in section 3.18, above.

Failure to timely submit a written Notice of Potential Change shall constitute a complete waiver by Contractor of any right to later submit a change order request or pursue a Claim on that issue, or to later pursue any additional money or time extensions in any manner related to that issue, regardless of the merits. Contractor will not have satisfied a condition precedent or exhausted administrative remedies. Contractor acknowledges that these written notices are of critical importance to the Owner's Work and Project management and the mitigation of Work and Project costs and delays.

4.5.2 **CHANGE ORDERS REQUESTS**

If, after submitting a written Notice of Potential Change pursuant to Section 4.5.1, Contractor continues to believes that it is entitled to additional money or time (including but not limited to grant of a time extension; payment of money or damages arising from work done by, or on behalf of, the Contractor, payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to; or an amount the payment of which is disputed by the Owner) based on an issue, then Contractor shall submit a Change Order Request ("COR") to Owner within twenty (20) days of (i) becoming aware of the issues creating a potential change, or (ii) the date by which it should have become aware of the issues creating a potential change. A rejection at any time or a lack of a rejection by Owner of a Notice of Potential Change does not affect the timeline for submitting a COR.

Failure to timely submit a COR related to an issue, or failure to comply with any of the COR requirements in the Contract shall constitute a complete waiver by Contractor of any right to later submit a COR or Claim on that issue, or to later pursue any additional money (including time extensions) in any manner related to that issue, regardless of the merits. Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

The COR shall state the grounds for the additional money or time requested and the amount of money or time requested, and Contractor shall include all information supporting the COR.

Contractor shall certify the COR using the form set forth in Section 4.5.5.1, except that every reference to "Claim" shall be changed to "COR." If a COR is submitted without certification, a certification can still be submitted within the timelines set forth in the first paragraph of section 4.5.2. If the COR is not timely certified, Contractor will have completely waived its rights to

any money or time for that issue. Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

The Owner may accept the entire COR, accept part of the COR and reject the remainder, reject the entire COR, or request additional information. If the Owner does not respond within thirty (30) days by accepting the entire COR, accepting part of the COR and rejecting the remainder, or requesting additional information, the entire COR shall be deemed rejected as of the thirtieth (30th) day. If the Owner requests additional information, then the Contractor shall submit the information within fifteen (15) days of the date of the request and the Owner shall have fifteen (15) days after the receipt of the additional information to accept or reject (in whole or in part) the COR. If the Owner fails to respond within fifteen (15) days after the submission of additional information, the entire COR shall be deemed rejected as of the fifteenth (15th) day.

4.5.3 **DEFINITION OF CLAIM**

A "Claim" is a separate demand by the Contractor sent by registered or certified mail, return receipt requested, for (a) a time extension, including, without limitation, a request for relief from damages or penalties for delay assessed by Owner under the Contract Documents; (b) payment by Owner of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Contract Documents, and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to; or (c) an amount the payment of which is disputed by the Owner. A Claim includes any claim within the scope of Public Contract Code section 20104 et seq. Resubmittal in any manner of a COR which was previously rejected under Section 4.5.2 constitutes a Claim, whether the COR was rejected in whole or in part, and whether the COR was rejected expressly or deemed rejected by Owner inaction. A Claim includes any dispute Contractor may have with the Owner, including one which does not require a Notice of Potential Change or COR under Sections 4.5.1 and 4.5.2, and includes an alleged breach of contract by the Owner. A Claim under this Article 4.5 shall also constitute a claim for purposes of the California False Claims Act. In the event of a conflict between a Claims provision in Division 1 of the Specifications and Section 4.5, Section 4.5 shall take precedence.

The Notice of Potential Change and COR procedures above are less formal procedures which precede the more formal Claim. A Notice of Potential Change does not constitute a Claim. A COR does not constitute a Claim; **except that** if insufficient time remains before the Claim deadline (see Article 4.5.4) for Contractor to submit a COR and for Owner to process and reject the COR under Article 4.5.2, then either (1) Contractor may submit a COR which Owner shall treat as a Claim, but only if the COR complies with all requirements in this Article 4.5 and Article 7 for COR's and Claims, or (2) a COR is not required so long as a Claim complying with this Article 4.5 is timely submitted.

A Claim does not include vouchers, invoices, progress payment applications, or other routine or authorized forms of requests for progress payments on the Contract; however, those documents remain "claims" for purposes of the California False Claims Act. A Claim does not include a Government Code Claim. ("Government Code Claim" means a claim under Government Code sections 900 et seq. and 910 et seq.)

4.5.4 TIME FOR SUBMITTING CLAIM; WAIVER

Contractor shall submit a Claim to the Owner's construction manager (or in the absence of a construction manager, to Architect and Owner) within thirty (30) days of the Owner's rejection of a COR in whole or in part, or of a COR being deemed rejected, pursuant to Section 4.5.2 above; but if a Claim has not been submitted as of the date that the Contractor Completes the Work and submittal of the Claim was not yet required under the Contract Documents, then the Claim shall be submitted within seven (7) days of Completion of the Work, and such Claim shall not be barred due to lack of a Notice of Potential Change or COR if the deadline for the Notice of Potential Change or COR was after Completion of the Work.

In addition, within seven (7) days of Completion of the Work, Contractor shall submit to Owner, in writing, a list and summary of all Claims for money or time extensions under or arising out of this Contract which were timely filed, which were fully compliant with the Contract's requirements for Claims, and which the Contractor wishes to pursue in whole or in part. This Claim summary requirement shall not extend the time for submitting a Claim.

Failure to timely submit a Claim or Claim summary, failure to specifically identify a Claim in the Claim summary, or failure to comply with any of the requirements in the Contract for a Claim, including but not limited to this Article 4, will act as a complete waiver of Contractor's rights to (a) recover money or time on the issues for which a Claim was required, (b) submit a Government Code Claim for the money or time (see Section 4.5.6.4), and (c) initiate any action, proceeding or litigation for the money or time, regardless of the merits; Contractor will not have satisfied a condition precedent or exhausted administrative remedies. Owner does not have an obligation to reject the Claim for a failure to comply with any of the Claim requirements in the Contract, including the lack of certification, and any failure by Owner to reject, or any delay in rejecting, a Claim on that basis does not waive the Owner's right to reject the Claim on that basis at a later time. In no event may the Contractor reserve its rights to assert a Claim for a time extension or additional money beyond the timelines set forth in this provision unless the Owner agrees in writing to allow the reservation.

4.5.5 CONTENT OF CLAIM

4.5.5.1 *Claim Format; Waiver*

Every Claim shall be in writing. All money or time extensions sought must be stated and itemized in the Claim at the time submitted. The responsibility to substantiate Claims shall rest with the Contractor, and the Contractor shall furnish reasonable documentation to support each Claim, including as applicable, that documentation set forth in sections 4.5.5.2 through 4.5.5.4. In addition, the Contractor shall include a certification with each and every Claim at the time of submission, as follows:

> I, _____ *[name of declarant]*, declare the following:
>
> _____ *[Contractor company name]* has contracted with ____ *[public entity name]* for the _____ Contract ("Contract").

_____ *[Contractor company name]* authorized me to prepare the attached Claim for money and/or time extension for _____ *[public entity name]* regarding this Contract (such Claim being dated _____, 20__, and entitled _____, and requesting $_____ and/or ___ additional days), and I prepared the attached Claim. I am the most knowledgeable person at _____ *[Contractor company name]* regarding this Claim.

The attached Claim complies with all laws applicable to submission of a Claim, including but not limited to California Penal Code section 72, Government Code sections 12650 et seq. (False Claims Act), and Business and Professions Code sections 17200 et seq. (Unfair Business Practices Act). I am aware that submission or certification of false claims, or other claims that violate law or the Contract, may lead to fines, imprisonment, and/or other serious legal consequences for myself or _____ *[Contractor company name]*.

The attached Claim does not breach the Contract, is not a false claim, does not violate any applicable law, satisfies all provisions of the Contract applicable to submission of the Claim, only contains truthful and accurate supporting data, and only requests money and/or time extensions that accurately reflect the adjustments to money and time for which I believe that _____ *[public entity name]* is responsible under its Contract with _____ *[Contractor company name]*.

While preparing this declaration and Claim I consulted with others (including attorneys, consultants, or others who work for _____ *[Contractor company name]*) when necessary to ensure that the statements were true and correct.

Contractor understands and agrees that any Claim submitted without this certification does not meet the terms of the Contract Documents; that Owner, or Owner's representatives, may reject the Claim on that basis; and that unless Contractor properly and timely files the Claim with the certification, Contractor cannot further pursue the Claim in any forum and all rights to additional money or time for the issues covered by the Claim are waived due to a condition precedent not having been satisfied.

I declare under the penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed _____, 20__, at _____, California.

_____ *[signature]*
_____ *[name of declarant]*

Contractor's failure to timely submit a certification will constitute a complete waiver of Contractor's rights to (a) recover money or time on the issues for which a Claim was required, (b) submit a Government Code Claim (see Section 4.5.6.3) for the money or time, and (c) initiate any action, proceeding or litigation for the money or time. Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

4.5.5.2 *Claims for Additional Money*

Each Claim for additional money (including but not limited to those described in (b) and (c) of the first paragraph of Section 4.5.3) must include all facts supporting the Claim, including but not limited to all supporting documentation plus a written analysis as to (a) why the claimed cost was incurred, (b) why Contractor could not mitigate its costs, (c) why the claimed cost is the responsibility of the Owner, and (d) why the claimed cost is a reasonable amount. In no event will the Contractor be allowed to reserve its rights to assert a Claim for money at a later time, unless the Owner expressly agrees in writing to allow the reservation. Any costs, direct or indirect, not asserted shall be waived. A Claim may not include any costs incurred in preparation of the Claim or in preparation of any underlying COR, including but not limited to costs of delay analysis.

4.5.5.3 *Claims for Additional Time*

4.5.5.3.1 *Notice of Extent of Claim*

If the Contractor wishes to make a Claim for an increase in the Contract Time (including but not limited to Section 4.5.3(a)), the Claim shall include, but not be limited to, all facts supporting the Claim, all documentation of such facts, all information required by the Contract Documents, and a current schedule and delay analysis explaining (a) the nature of the delay, (b) the Owner's responsibility for the claimed delay, (c) the claimed delay's impact on the critical path, (d) the claimed delay's impact on the date of Completion (including an analysis of any float still remaining and whether the alleged delay in work exceeds such remaining float), and (e) why Contractor could not mitigate the delay impacts.

In the case of a continuing delay, only one (1) initial Claim is necessary that is based on estimates of when the continuing delay will end, but within thirty (30) days of the end of the continuing delay an updated final Claim must be submitted, which shall also be certified. In no event will the Contractor be allowed to reserve its rights to assert a Claim for a time extension, unless the Owner expressly agrees in writing to allow the reservation. Any time extension not asserted shall be waived.

4.5.5.3.2 *Unusually Severe Weather Claims*

If unusually severe weather is the basis for a Claim for additional time, Contractor must provide Owner data and facts showing that the weather conditions were abnormal for the period of time, could not have been reasonably anticipated or mitigated, and had an adverse effect on the critical path of the scheduled construction.

4.5.5.4 ***"Pass Through" Claims***

A Subcontractor or supplier to Contractor may not submit a request for additional time or money directly to the Owner. If a subcontractor or supplier submits a request for additional money or time to Contractor and Contractor wishes to pass it through to Owner, then Contractor must comply with all requirements of Section 4.5, including Notices of Potential Change, Change Order Requests, and Claims, and Public Contract Code section 9204(d)(5). Contractor must prepare and submit its own analysis of the Subcontractor's request, and the Claim must include a copy of the Subcontractor's request along with any other necessary supporting documentation.

In addition to the other requirements in the Contract Documents, including but not limited to this Section 4.5, the Contractor's analysis of the Subcontractor's request must include Contractor's detailed explanation as to why the Subcontractor or supplier's request is the Owner's responsibility, including Contractor's analysis of (a) why the amount of damages the Subcontractor or supplier requests is justified and appropriate, (b) how Contractor's breach of the subcontract caused the Subcontractor or supplier to incur these damages, and (c) how the Owner's breach of the Contract caused the Contractor's breach of the subcontract. Any Contractor Claim that fails to include the above information, or that states that Owner is responsible for the Subcontractor's request only in the event that Contractor is found to owe money to Subcontractor, shall act as a complete waiver of Contractor's rights to (a) recover money or time on the issues for which a Claim was required, (b) submit a Government Code Claim (see Section 4.5.6.4) for the money or time, and (c) initiate any action, proceeding or litigation for the money or time. Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

4.5.6 PROCEDURES FOR CLAIMS (PUBLIC CONTRACT CODE SECTION 9204)

Claims are subject to this section 4.5.6 and Public Contract Code section 9204, as well as the separate procedures and substantive provisions of Sections 4.5.1 through 4.5.5 and the rest of the Contract Documents. Claims of $375,000 or less must also comply with Public Contract Code sections 20104 et seq., but to the extent that one of the procedures in Sections 20104 et seq. conflicts with the procedures in Section 9204, the requirements of Section 9204 shall control.

4.5.6.1 ***Claims***

The Owner shall conduct a reasonable review of the Claim and shall respond in writing to any written Claim within 45 days of receipt of the Claim. During that 45-day period, plus any extension, Owner may request, in writing, additional documentation supporting the Claim or relating to defenses to the Claim the Owner may have against the Contractor. Owner shall review any additional documentation Contractor supplies in response to that request within the 45 day, plus any extension, timeline.

After receipt of a Claim, the 45-day period may be extended by Owner and Contractor. The written response shall identify which portion of the Claim is disputed and what portion is undisputed. If Owner needs approval from its governing board to provide the written response, and the governing board does not meet within the 45 days or any extended period of time, then

the Owner shall have up to three days after the next publicly noticed meeting of the governing board to provide the written response. Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after the Owner issues the written response. Owner's failure to respond to a Claim within the above time periods or to otherwise meet the above time requirements shall result in the Claim being deemed rejected in its entirety.

4.5.6.2 ***Meet and Confer***

If the Contractor disputes the Owner's written response, or the Owner fails to respond within the time prescribed, the Contractor may so notify the Owner, in writing, either within 15 days of receipt of the Owner's response or within 15 days of the Owner's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a written demand sent by registered or certified mail return receipt requested, the Owner shall schedule a meet and confer conference for settlement of the dispute, which shall take place within 30 days of the demand. Upon written agreement of the Owner and Contractor, the conference may take place during regularly scheduled Project meetings.

If Contractor fails to timely notify the Owner that it wishes to meet and confer pursuant to the previous paragraph, then Contractor will have waived all rights to (a) recover money or time on the issues for which a Claim was required, (b) submit a Government Code Claim (see Section 4.5.6) for such money or time, and (c) initiate any action, proceeding or litigation for such money or time. Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

Within ten (10) business days after the conclusion of the meet and confer conference, the Owner shall give a written statement to the Contractor identifying the portion of the Claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after the Owner issues the written statement. Within ten (10) business days of issuance of Owner's written statement, Contractor shall identify in writing the disputed portion of the Claim that shall be submitted to non-binding mediation (which may consist of any nonbinding process, including but not limited to neutral evaluation or a dispute review board), with the Owner and Contractor sharing the costs equally. The Owner and Contractor shall mutually agree to a mediator within ten (10) business days after the Contractor has identified in writing the disputed portion of the Claim. If they cannot agree upon a mediator, then each shall select a mediator and those two mediators shall select a qualified neutral third party to mediate the disputed portion of the Claim. (Each party shall bear the fees and costs its respective mediator charged in connection with the selection of the neutral mediator). The parties may mutually waive in writing the requirement for mediation. If Contractor fails to timely notify the Owner in writing that it wishes to mediate pursuant to this paragraph, Contractor will have waived all right to further pursue the Claim pursuant to section 4.5.4. The parties shall reasonably cooperate to schedule and attend a mediation as soon as reasonably possible. Owner's failure to respond to the Claim within the above time periods or to otherwise meet the above time requirements shall result in the Claim being deemed rejected in its entirety.

4.5.6.3 *Government Code Claim*

If the Claim or any portion remains in dispute after the mediation and Contractor wishes to pursue it, the Contractor **must** file a timely and proper Government Code Claim. The filing of a Government Code Claim is specifically required in addition to all contractual procedures described in Sections 4.5 through 4.5.6.2. The above contractual procedures do not act as a substitute for the Government Code Claim process, and the two sets of procedures shall be sequential with the contractual procedures coming first.

Failure to timely file a Government Code Claim shall act as complete waiver of Contractor's rights to (a) recover money or time on the issues for which a Government Code Claim was required, and (b) initiate any action, proceeding or litigation for such money or time. Contractor will not have satisfied a condition precedent or exhausted administrative remedies.

Owner and Contractor shall proceed with the Government Code Claim according to Government Code, Section 900 et seq., and as otherwise permitted by law. For purposes of the applicable Government Code provisions, and as provided in Public Contract Code section 20104.2(e), the running of the time period within which a Contractor must file a Government Code Claim shall be tolled from the time the Contractor submits a written Claim under Article 4.5 until the time that the Claim is denied, in whole or in part, as a result of the meet and confer process in Section 4.5.6.2, including any period of time utilized by the meet and confer process.

4.5.7 CONTINUING CONTRACT PERFORMANCE

Despite submission or rejection of a Notice of Potential Change, COR or Claim, the Contractor shall proceed diligently with performance of the Contract as directed by Owner, and the Owner shall continue to make any undisputed payments in accordance with the Contract.

4.5.8 CLAIMS FOR CONCEALED OR UNKNOWN CONDITIONS

4.5.8.1 *Trenches or Excavations Less Than Four Feet Below the Surface*

If Contractor encounters conditions at the Site which are subsurface or otherwise concealed physical conditions, which differ materially from those indicated in the Contract Documents, or unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall give notice to the Owner promptly before conditions are disturbed and in no event later than ten (10) days after first observance of the conditions. If Contractor believes that such conditions differ materially and will cause an increase in the Contractor's cost of, time required for, or performance of any part of the Work, Contractor must comply with the provisions above for Notice of Potential Change, Change Order Request, and Claims (beginning with Section 4.5.1).

4.5.8.2 *Trenches or Excavations Greater Than Four Feet Below the Surface*

Pursuant to Public Contract Code section 7104, when any excavation or trenching extends

greater than four feet below the surface:

4.5.8.2.1 The Contractor shall promptly, and before the following conditions are disturbed, notify the public entity, in writing, of any:

(1) Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with the provisions of existing law.

(2) Subsurface or latent physical conditions at the site differing from those indicated by information about the site made available to bidders prior to the deadline for submitting bids.

(3) Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

4.5.8.2.2 The public entity shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work shall issue a change order under the procedures described in the Contract.

4.5.8.2.3 In the event that a dispute arises between the public entity and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any deadline for Completion provided by the Contract, but shall proceed with all Work to be performed under the Contract. The Contractor shall retain any and all rights provided either by Contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

4.5.9 INJURY OR DAMAGE TO PERSON OR PROPERTY

If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, any of the other party's employees or agents, or others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding ten (10) days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. For a Notice of Potential Change, COR and Claim for additional cost or time related to this injury or damage, Contractor shall follow Section 4.5.

ARTICLE 5

SUBCONTRACTORS

5.1 DEFINITIONS

5.1.1 SUBCONTRACTOR

A Subcontractor is a person or entity, who has a contract with the Contractor to perform a portion of the Work at the Site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor. To the extent that the term Trade Contractor is utilized in the Contract Documents, it shall have the same meaning as the term "Subcontractor."

5.1.2 SUB-SUBCONTRACTOR

A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the Site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

5.1.3 SPECIALTY CONTRACTORS

If a Subcontractor is designated as a "Specialty Contractor" as defined in section 7058 of the Business and Professions Code, all of the Work outside of that Subcontractor's specialty shall be performed in compliance with the Subletting and Subcontracting Fair Practices Act, Public Contract Code sections 4100, et seq.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 ASSIGNMENT OR SUBSTITUTION - CONSENT OF OWNER

In accordance with Public Contract Code sections 4107 and 4107.5, no Contractor whose bid is accepted shall, without the written consent of the Owner: substitute any person or entity as a Subcontractor in place of the Subcontractor designated in the original bid; permit any such Subcontract to be assigned or transferred, or allow it to be performed by any person or entity other than the original Subcontractor listed in the original bid; sublet or subcontract any portion of the Work in excess of one-half of one percent (0.5%) of the Contractor's total bid as to which its original bid did not designate a Subcontractor. Any assignment or substitution made without the prior written consent of the awarding authority shall be void, and the assignees shall acquire no rights in the Contract. Any consent, if given, shall not relieve Contractor or its Subcontractors from their obligations under the terms of the Contract Documents.

5.2.2 **GROUNDS FOR SUBSTITUTION**

Pursuant to Public Contract Code section 4107 and the procedure set forth therein, no Contractor whose bid is accepted may request to substitute any person or entity as a Subcontractor in place of a Subcontractor listed in the original bid except in the following instances:

A. When the Subcontractor listed in the bid after having a reasonable opportunity to do so, fails or refuses to execute a written contract for the scope of work specified in the subcontractor's bid and at the price specified in the subcontractor's bid, when that written contract, based upon the general terms, conditions, plans and specifications for the Project involved or the terms of that Subcontractor's written bid, is presented to the Subcontractor by the Contractor;

B. When the listed Subcontractor becomes insolvent or the subject of an order for relief in bankruptcy;

C. When the listed Subcontractor fails or refuses to perform his or her Subcontract;

D. When the listed Subcontractor fails or refuses to meet the bond requirements of the prime contractor set forth in Public Contract Code section 4108.

E. When the Contractor demonstrates to the awarding authority, or its duly authorized officer, subject to the further provisions of Public Contract Code section 4107.5, that the name of the Subcontractor was listed as the result of inadvertent clerical error;

F. When the listed Subcontractor is not licensed pursuant to the Contractors License Law; or

G. When the awarding authority, or its duly authorized officer, determines that the Work being performed by the listed Subcontractor is substantially unsatisfactory and not in substantial accordance with the plans and specifications, or the Subcontractor is substantially delaying or disrupting the progress of the Work.

H. When the listed Subcontractor is ineligible to work on a public works project pursuant to Section 1777.1 of the Labor Code.

I. When the awarding authority determines that a listed Subcontractor is not a responsible contractor.

5.2.2.1 ***No Change in Contract.*** Any substitutions of Subcontractors shall not result in any increase in the Contract Sum or result in the granting of any extension of time for a Milestone Deadline or the Completion of the Work.

5.2.2.2 ***Substitution Due to Clerical Error.*** The Contractor, as a condition of asserting a claim of inadvertent clerical error in the listing of a Subcontractor, shall, pursuant to Public

Contract Code section 4107.5, within two (2) working days after the time of the prime bid opening by the awarding authority, give written notice to the awarding authority and copies of such notice to both the Subcontractor it claims to have listed in error, and the intended Subcontractor who had bid to the Contractor prior to bid opening. Any listed Subcontractor who has been notified by the Contractor in accordance with the provisions of this section as to an inadvertent clerical error, shall be allowed six (6) working days from the time of the prime bid opening within which to submit to the awarding authority and to the Contractor written objection to the Contractor's claim of inadvertent clerical error.

In all other cases, the Contractor must make a request in writing to the awarding authority for the substitution of a subcontractor, giving reasons therefore. The awarding authority shall mail a written notice to the listed Subcontractor giving reasons for the proposed substitution. The listed Subcontractor shall have five (5) working days from the date of such notice within which to file with the awarding authority written objections to the substitution.

Failure to file written objections pursuant to the provisions of this section within the times specified herein shall constitute a complete waiver of objection to the substitution by the listed Subcontractor and, where the ground for substitution is an inadvertent clerical error, an agreement by the listed Subcontractor that an inadvertent clerical error was made.

If written objections are filed, the awarding authority shall give five (5) days notice to the Contractor and to the listed Subcontractor of a hearing by the awarding authority on the Contractor's request for substitution as provided in Public Contract Code section 4107. The determination by the awarding authority shall be final.

5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all obligations and responsibilities, which the Contractor, by the Contract Documents, assumes toward the Owner. Each subcontract agreement shall preserve and protect the rights of the Owner under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound. Upon written request of the Subcontractor, the Contractor shall identify to the Subcontractor the terms and conditions of the proposed subcontract agreement, which may be at variance with the Contract Documents. Subcontractors shall similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that:

A. Assignment is effective only after termination of the Contract with the Contractor by the Owner for cause pursuant to Article 14 and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor in writing; and

B. Assignment is subject to the prior rights of the surety, if any, obligated under any bond relating to the Contract.

5.5 SUBCONTRACTOR'S RESPONSIBILITIES

Every Subcontractor is bound to the following provisions, unless specifically noted to the contrary in the Subcontractor's contract subject to the limitations of section 5.3.

5.5.1 SUPERVISION BY SUBCONTRACTORS

Subcontractors shall efficiently supervise their Work, using their best skill and attention. Each of them shall carefully study and compare all Drawings, Specifications, and other instructions, shall at once report to Contractor any error or omission which any of them may discover, and shall subsequently proceed with the Work in accordance with instructions from the Contractor concerning such error or omission. Each Subcontractor shall be fully responsible for and shall bear the full risk of loss of all of its property.

5.5.2 DISCIPLINE AND ORDER

Each Subcontractor shall at all times enforce strict discipline and good order among its Subcontractors, material or equipment suppliers, or their agents, employees, and invitees, and shall establish and maintain surveillance over the activities of each of the foregoing to minimize any disturbance, damage, pollution, or unsightly conditions relative to property areas adjacent to or in the vicinity of the Site. The Contractor shall have the right to remove from the Work any employee of a Subcontractor for any reason including, without limitation, incompetence or carelessness.

5.5.3 DEFECTS DISCOVERED

Should the proper and accurate performance of the Work depend upon the proper and accurate performance of other work not included in its Contract, each Subcontractor shall use all necessary means to discover any defect in such other work and shall allow the Contractor, the Owner and Architect, or other Subcontractors as Contractor elects, a reasonable amount of time to remedy such defects. If the Subcontractor should proceed with its Work, it shall be considered to have accepted such other work, unless the Subcontractor shall have proceeded pursuant to

instructions in writing by the Contractor over its written objection.

5.5.4 SUBCONTRACTOR INFORMATION

Each Subcontractor shall submit to the Owner, the Contractor, or the Architect, as the case may be, promptly when requested by any of the foregoing, information with respect to the names, responsibilities, and titles of the principal members of its staff, the adequacy of the Subcontractor's equipment and the availability of necessary materials and supplies. Subcontractor shall fully cooperate with Contractor in its periodic review of the adequacy of Subcontractor's supervision, personnel, and equipment, and the availability of necessary materials and supplies and shall promptly comply with the requirements of the Contractor with respect thereto.

5.5.5 TEMPORARY STRUCTURES

Each Subcontractor shall furnish at its expense its own temporary facilities and storage except those specifically agreed to be furnished to it by the Contractor in the Subcontract Agreement. Subcontractor's material storage rooms and field offices, etc., will be placed in locations designated by the Contractor. When it becomes necessary due to the progress of the Work for the Subcontractor to relocate its field operations, it will do so in an expeditious manner and at no additional cost to Contractor or Owner. The construction of material storage rooms and field offices, etc., will be of fire resistive material only, such as concrete or gypsum block, rated drywall, or sheet metal.

5.5.6 CHARGES TO SUBCONTRACTOR

Each Subcontractor may be subject to the Contractor's reasonable charges for hoisting, repair to other work caused by the fault or negligence of Subcontractor, removal of Subcontractor's rubbish, and clean-up occasioned by Subcontractor.

5.5.7 FINES IMPOSED

Subcontractor shall comply with and pay any fines or penalties imposed for violation of any applicable law, ordinance, rule, regulation, Environmental Impact Report mitigation requirement, and lawful order of any public authority, including, without limitation, all OSHA and California OSHA requirements and those of other authorities having jurisdiction of the safety of persons or property.

5.5.8 PROJECT SIGNS

Each Subcontractor shall not display on or about the Project any sign, trademark, or other advertisement. The Owner will permit a single Project sign, which shall be subject to the Owner's prior and sole discretion and approval, as to all matters including, without limitation, size, location, material, colors, style and size of printing, logos and trademarks (if any), text, and selection of names to be displayed.

5.5.9 REMEDIES FOR FAILURE TO PERFORM

Without limitation of any other right or remedy available to Contractor under the Contract Documents or at law, should: the Subcontractor fail to perform its portion of the Work in a skilled and expeditious manner in accordance with the terms of the Contract Documents with sufficient labor, materials, equipment, and facilities; delays the progress of the job or otherwise fail in any of its obligations; or either a receiver is appointed for the Subcontractor or the Subcontractor is declared to be bankrupt or insolvent, and such appointment, bankruptcy, or insolvency proceedings or declaration is not set aside within thirty (30) days, then the Contractor, upon three (3) days notice to the Subcontractor (subject to the requirements of Pub. Contracts Code, § 4107), may provide such labor, materials, or perform such work and recover the cost plus profit and overhead from monies due or to become due thereafter to the Subcontractor. The Contractor may terminate the employment of the Subcontractor, taking possession of its tools, materials, and equipment related to the Work and cause the entire portion of the Subcontractor's Work to be finished either by another Subcontractor or through the Contractor's own forces.

5.5.10 DISPUTES NOT TO AFFECT WORK

In the event of any dispute as to whether or not any portion of the Work is within the scope of the Work to be performed by a Subcontractor, or any dispute as to whether or not the Subcontractor is entitled to a Change Order for any Work requested of it or entitled to payment, the Subcontractor shall continue to proceed diligently with the performance of the Work. Regardless of the size or nature of the dispute, the Subcontractor shall not under any circumstances cease or delay performance of its portion of the Work during the existence of the dispute. The Contractor shall continue to pay the undisputed amounts called for under the Subcontract Agreement during the existence of the dispute. Any party stopping or delaying the progress of the Work because of a dispute shall be responsible in damages to the Owner, the Architect, and the Contractor for any losses suffered as a result of the delay.

5.5.11 APPLICATION FOR PAYMENT

Contractor agrees to advise the Subcontractor if any documentation in connection with the Subcontractor's application for payment has not been accepted or is in any way unsatisfactory.

5.5.12 COMPLIANCE WITH PROCEDURES

Each Subcontractor shall comply with all procedures established by the Contractor for coordination among the Owner, the Owner's consultants, Architect, Contractor, and the various Subcontractors for coordination of the Work with all local municipal authorities, government agencies, utility companies, and any other agencies with jurisdiction over all or any portion of the Work. The Subcontractor shall cooperate fully with all of the foregoing parties and authorities.

5.5.13 ON-SITE RECORD KEEPING

Subcontractor shall comply with all on-Site record keeping systems established by the Contractor

and shall, upon the request of the Contractor, provide the Contractor with such information and reports as the Contractor may deem appropriate. Without limitation of the foregoing, the Subcontractor shall assemble all required permits and certificates so that they are readily accessible at the Site.

5.5.14 NON-EXCLUSIVE OBLIGATIONS

The specific requirements of Article 5 are not intended to exclude the obligation of the Subcontractor to comply with any of the other provisions of the General Conditions and the other Contract Documents which are relevant to the proper performance of its portion of the Work.

ARTICLE 6

CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 OWNER'S RIGHTS

The Owner reserves the right to perform Project work related to the Contract with the Owner's own forces, or to award separate contracts in connection with such other work or other construction or operations on the Site under conditions of the Contract identical or substantially similar to these including those portions related to insurance. Upon the election to perform such work with its own forces or by separate contracts, the Owner shall notify the Contractor. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall proceed pursuant to Section 4.5 in the Contract Documents.

6.1.2 DESIGNATION AS CONTRACTOR

When separate contracts are awarded for different portions of the Project or other construction or operations on the Site, the term "Contractor" in the Contract Documents in each of those contracts shall mean the contractor who executes each separate Owner/Contractor agreement.

6.1.3 CONTRACTOR DUTIES

Although the Owner shall have overall responsibility for coordination and scheduling of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, Contractor shall cooperate with Owner. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule and Contract Sum deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor until subsequently revised.

6.1.4 OWNER OBLIGATIONS

Unless otherwise provided in the Contract Documents, when the Owner performs work related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations, and to have the same rights, which apply to the Contractor under the General Conditions, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10 and 12.

6.2 MUTUAL RESPONSIBILITY

6.2.1 DELIVERY AND STORAGE

The Contractor shall afford the Owner and separate contractors reasonable opportunity for delivery and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the separate contractors' construction and operations with theirs as required by the Contract Documents.

6.2.2 NOTICE BY CONTRACTOR

If part of the Contractor's Work depends upon proper execution or results from work by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Owner patent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor to so report shall constitute an acknowledgment that the Owner's or separate contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

6.2.3 COSTS INCURRED

Costs, expenses, and damages caused by delays, improperly timed activities, defective construction, or damages to another's work/Work or property shall be borne by the party responsible. Should Contractor cause damage to the work or property of any other contractor on the Project, or to the Project or the property of a third party, or cause any delay to any such contractor or third party, the Contractor shall defend, indemnify and hold Owner harmless for such damage or delay under Section 3.16, above. Owner may withhold from progress payments and/or retention for the cost of such damage or delay.

6.2.4 CORRECTION OF DAMAGE

The Contractor shall promptly remedy damage wrongfully caused by the Contractor to completed or partially completed construction or to property of the Owner or separate contractors.

6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors, and the Owner as to the

responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish as described in Section 3.13, the Owner may clean up and allocate the cost among those responsible as the Owner determines to be just.

ARTICLE 7

CHANGES IN THE WORK

7.1 CHANGES

7.1.1 NO CHANGES WITHOUT AUTHORIZATION

The Owner reserves the right to change the Work by making such alterations, deviations, additions to, or deletions from the plans and specifications, as may be deemed by the Owner to be necessary or advisable for the proper Completion or construction of the Work contemplated, and Owner reserves the right to require Contractor to perform such work. No adjustment will be made in the Contract unit price of any Contract item regardless of the quantity ultimately required.

Owner shall compensate Contractor with money or grant extra time for any extra work ordered by the Owner to be performed. Contractor shall follow the provisions of 7.6 and 7.7 when requesting additional money or additional time. Contractor shall expeditiously perform all extra work upon direction, even if no agreement has been reached on extra time or money. For all such changes resulting in a credit to Owner, Contractor shall follow 7.5 and 7.7 in providing the credit to Owner. Contractor shall bring all potential credits to the Owner's attention.

There shall be no change whatsoever in the drawings, specifications, or in the Work or payments under the Contract Documents without an executed Change Order, Construction Change Directive, or order by the Owner pursuant to Section 7.1.2. Owner shall not be liable for the cost of any extra work or any substitutions, changes, additions, omissions, or deviations from the Drawings and Specifications unless the same shall have been properly requested under Section 4.5 and authorized by, and the cost thereof approved in writing by, Change Order or Construction Change Directive. No extension of time for performance of the Work shall be allowed hereunder unless request for such extension is properly made under Section 4.5 and such time is thereof approved in writing by Change Order or Construction Change Directive. The provisions of the Contract Documents shall apply to all such changes, additions, and omissions with the same effect as if originally embodied in the Drawings and Specifications.

7.1.2 AUTHORITY TO ORDER MINOR CHANGES

The Owner has authority to order minor changes in the Work not involving any adjustment in the Contract Sum, an extension of the Contract Time, or a change which is inconsistent with the intent of the Contract Documents. Such changes shall be effected by written Construction Change Directive and shall be binding on the Contractor. The Contractor shall carry out such written orders promptly.

7.2 CHANGE ORDERS ("CO")

A CO is a written instrument signed by the Owner and the Contractor, stamped (or sealed) and signed by Architect, and approved by the Owner's Governing Board and DSA, stating the agreement of Owner and Contractor upon all of the following:

A. A change in the Work;

B. The amount of the adjustment in the Contract Sum, if any; and

C. The extent of the adjustment in the Contract Time, if any.

Unless expressly stated otherwise in the CO, any CO executed by Owner and Contractor constitutes and includes full and complete money and time (including but not limited to, adjustments to money and time) for all costs and effects caused by any of the changes described within it. Unless expressly stated otherwise in the CO, in consideration for the money received for the changes described in the CO, Contractor waives all Claims for all costs and effects caused by any of the changes, including but not limited to labor, equipment, materials, delay, extra work, overhead (home and field), profit, direct costs, indirect costs, acceleration, disruption, impaired productivity, time extensions, and any the costs and effects on Subcontractors and suppliers of any tier.

7.3 CONSTRUCTION CHANGE DIRECTIVES ("CCD")

7.3.1 DEFINITION

A CCD is a written unilateral order signed by the Owner, and if necessary by the Architect, directing a change in the Work and stating an adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by CCD, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions pursuant to Section 7.1.1.

7.3.2 USE TO DIRECT CHANGE

A CCD shall be used in the absence of agreement on the terms of a CO. If Contractor disagrees with the terms of a CCD, it shall nevertheless perform the work directed by the CCD, but it may pursue the Notice of Potential Change, COR and Claim procedures of Section 4.5 if Contractor believes it is entitled to changes in the Contract Sum or Contract Time.

7.4 REQUEST FOR INFORMATION ("RFI")

7.4.1 DEFINITION

An RFI is a written request prepared by the Contractor asking the Owner to provide additional information necessary to clarify an item which the Contractor feels is not clearly shown or called for in the drawings or specifications, or to address problems which have arisen under field

conditions.

7.4.2 **SCOPE**

The RFI shall reference all the applicable Contract Documents including specification section, detail, page numbers, drawing numbers, and sheet numbers, etc. The Contractor shall make suggestions and/or interpretations of the issue raised by the RFI. An RFI cannot modify the Contract Sum, Contract Time, or the Contract Documents.

7.4.3 **RESPONSE TIME**

Unless Owner expressly directs otherwise in writing, Contractor shall submit RFIs directly to the Architect, with copies forwarded to the Owner. Contractor shall submit a revised and updated priority schedule with each RFI. The Architect shall endeavor to follow the Contractor's requested order of priorities. The Owner and Contractor agree that an adequate time period for the Architect (or other designated recipient of the RFI) to respond to an RFI is generally fourteen (14) calendar days after the Architect's receipt of an RFI, unless the Owner and Contractor agree otherwise in writing. However, in all cases, the Architect shall take such time, whether more or less than 14 days, as is necessary in the Architect's professional judgment to permit adequate review and evaluation of the RFI. If Contractor informs the Architect that it needs a response to an RFI expedited to avoid delay to the critical path, the Architect shall provide a response as quickly as reasonably possible. The total time required for the Architect to respond is subject to the complexity of the RFI, the number of RFI's submitted concurrently and the reprioritization of pending RFI's submitted by the Contractor, among other things. If Contractor believes that the Architect's response results in a change in the Work that warrants additional money or time, or that Architect's response was unreasonably delayed and caused delay to the Work's critical path, Contractor shall follow the procedures for additional money or time under Section 4.5. No presumption shall arise as to the timeliness of the response if the response is more than fourteen (14) days after the Architect's receipt of the RFI. Contractor shall review the Contract Documents before submitting an RFI to ensure that the information is not already in the Contract Documents. To compensate the Owner for time and costs incurred for each time the information was already in the Contract Documents, Owner may withhold $100 from progress payments or retention in addition to any other remedies which Owner may have the right to pursue.

7.4.4 **COSTS INCURRED**

The Contractor shall be invoiced by the Owner for any costs incurred for professional services, which shall be withheld from progress payments or retention, if an RFI requests an interpretation or decision of a matter where the information sought is equally available to the party making such request.

7.5 **REQUEST FOR PROPOSAL ("RFP")**

7.5.1 **DEFINITION**

An RFP is Owner's written request asking the Contractor to submit to the Owner an estimate of

the effect, including credits, of a proposed change on the Contract Sum and the Contract Time.

7.5.2 SCOPE

An RFP shall contain adequate information, including any necessary drawings and specifications, to enable Contractor to provide the cost breakdowns required by section 7.7. The Contractor shall not be entitled to any additional money for preparing a response to an RFP, whether ultimately accepted or not.

7.6 CHANGE ORDER REQUEST ("COR")

7.6.1 DEFINITION

A COR is a written request prepared by the Contractor asking the Owner for additional money or time.

7.6.2 CHANGES IN PRICE

A COR shall include breakdowns per section 7.7 to validate any proposed change in Contract Sum.

7.6.3 CHANGES IN TIME

Where a change in a Milestone Deadline or Contract Time is requested, a COR shall also include delay analysis to validate any proposed change, and shall meet all requirements in these General Conditions, including but not limited to Section 8.4. Any additional time requested shall not be the number of days to make the proposed change, but must be based upon the impact to the Work schedule as defined in section 3.9 and Division 1 of the Specifications.

7.7 PRICE OF CHANGE ORDERS

7.7.1 SCOPE

Any COR shall provide in writing to the Owner, the Architect and any construction manager, the effect of the proposed CO upon the Contract Sum and the actual cost of construction, which shall include a complete itemized cost breakdown of all labor and material showing actual quantities, hours, unit prices, wage rates, required for the change, and the effect upon the Contract Time of such CO.

7.7.2 DETERMINATION OF COST

The amount of the increase or decrease in the Contract Sum resulting from a CO, if any, shall be determined in one or more of the following ways as applicable to a specific situation:

A. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

B. Unit prices stated in the Contractor's original bid, the Contract Documents, or subsequently agreed upon between the Owner and the Contractor;

C. Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

D. By cost of material and labor and percentage of overhead and profit. If the value is determined by this method the following requirements shall apply:

1. **Daily Reports by Contractor**.

a) General: At the close of each working day, the Contractor shall submit a daily report to the Inspector of Record and any construction manager, on forms approved by the Owner, together with applicable delivery tickets, listing all labor, materials, and equipment involved for that day, the location of the work, 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 Inspector of Record and the 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 the Contractor.

b) Labor: Show names of workers, classifications, and hours worked.

c) Materials: Describe and list quantities of materials used.

d) Equipment: Show type of equipment, size, identification number, and hours of operation, including, if applicable, loading and transportation.

e) Other Services and Expenditures: Describe in such detail as the Owner may require.

2. **Basis for Establishing Costs**.

a) Labor will be the actual cost for wages prevailing locally for each craft or type of workers 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 a labor classification, which would increase the extra work cost, will not be permitted unless the 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 shall be at invoice or lowest current price at which such materials are locally available and delivered to the Site in the quantities involved, plus sales tax, freight, and delivery.

The Owner reserves the right to approve materials and sources of supply or to supply materials to the 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.

Regardless of ownership, the rates to be used in determining equipment rental costs shall not exceed listed rates prevailing locally at equipment rental agencies 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 the Owner than holding it at the work Site, it shall be returned unless the Contractor elects to keep it at the work Site at no expense to the Owner.

All equipment shall be acceptable to the Inspector of Record, in good working condition, and suitable for the purpose for which it is to be used. Manufacturer's ratings and modifications shall be used to classify equipment, and equipment shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

d) Other Items. The Owner may authorize other items which may be required on the extra work. Such 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 the Contractor or any of the Subcontractors. Invoices covering all such items in detail shall be submitted with the Application for Payment.

e) Invoices. Vendors' invoices for material, equipment rental, and other expenditures shall be submitted with the COR. If the Application for Payment is not substantiated by invoices or other documentation, the Owner may establish the cost of the item involved at the lowest price which was current at the time of the Daily Report.

f) Overhead, premiums and profit. For overhead, including direct and indirect costs, submit with the COR and include: home office overhead, off-Site supervision, CO preparation/negotiation/research for Owner initiated changes, time delays, project interference and disruption, additional guaranty and warranty durations, on-Site supervision, additional temporary protection, additional temporary utilities, additional material handling costs, and additional safety equipment costs.

7.7.3 FORMAT FOR PROPOSED COST CHANGE

The following format shall be used as applicable by the Owner and the Contractor to communicate proposed additions and deductions to the Contract.

	EXTRA	CREDIT
A. Material (attach itemized quantity and unit cost plus sales tax, invoices, receipts, truck tags, etc., for force account work)	_____	_____
B. Labor (attach itemized hours and rates, daily logs, certified payroll, etc.)	_____	_____
C. Equipment (attach any invoices)	_____	_____
D. Subtotal	_____	_____
E. If Subcontractor performed Work, add Subcontractor's overhead and profit to portions performed by Subcontractor, not to exceed fifteen percent (15%) of item D.	_____	_____
F. Liability and Property Damage Insurance, Worker's Compensation Insurance, Social Security, and Unemployment Taxes, not to exceed twenty-five percent (25%) of Item B.	_____	_____
G. Subtotal	_____	_____
H. General Contractor's Overhead and Profit, not to exceed fifteen percent (15%) of Item G; and for work performed by subcontractors, not to exceed five percent (5%).	_____	_____

I.	Subtotal	_____	_____
J.	Bond not to exceed one percent (1%) of Item I.	_____	_____
K.	TOTAL	_____	_____

It is expressly understood that the value of such extra work or changes, as determined by any of the aforementioned methods, expressly includes (1) any and all of the Contractor's costs and expenses, both direct and indirect, resulting from additional time required on the project or resulting from delay to the project, and (2) any costs of preparing a COR, including but not limited to delay analysis. Any costs or expenses not included are deemed waived.

7.7.4 DISCOUNTS, REBATES, AND REFUNDS

For purposes of determining the cost, if any, of any change, addition, or omission to the Work hereunder, all trade discounts, rebates, refunds, and all returns from the sale of surplus materials and equipment shall accrue and be credited to the Contractor, and the Contractor shall make provisions so that such discounts, rebates, refunds, and returns may be secured, and the amount thereof shall be allowed as a reduction of the Contractor's cost in determining the actual cost of construction for purposes of any change, addition, or omissions in the Work as provided herein.

7.7.5 ACCOUNTING RECORDS

With respect to portions of the Work performed by COs and CCDs on a time-and-materials, unit-cost, or similar basis, the Contractor shall keep and maintain cost-accounting records satisfactory to the Owner, which shall be available to the Owner on the same terms as any other books and records the Contractor is required to maintain under the Contract Documents.

7.7.6 NOTICE REQUIRED

Contractor shall submit a written Notice of Potential Change for additional money or time pursuant to section 4.5.1.

7.7.7 APPLICABILITY TO SUBCONTRACTORS

Any requirements under this Article 7 shall be equally applicable to COs or CCDs issued to Subcontractors by the Contractor to the same extent required of the Contractor.

7.8 WAIVER OF RIGHT TO CLAIM MONEY OR TIME

Failure to demand money based on costs, or time extensions, as part of a COR constitutes a complete waiver of Contractor's right to claim the omitted money or time. All money or time for an issue must be included in the COR at the time submitted.

ARTICLE 8

TIME

8.1 DEFINITIONS

8.1.1 CONTRACT TIME

Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Completion of the Work.

8.1.2 NOTICE TO PROCEED

Contractor shall not commence the Work until it receives a Notice to Proceed from Owner. The date of commencement of the Work is the date established in the Notice to Proceed. The date of commencement shall not be postponed by the failure to act of the Contractor or of persons or entities for whom the Contractor is responsible.

8.1.3 DAYS

The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

8.2 HOURS OF WORK

8.2.1 SUFFICIENT FORCES

Contractors and Subcontractors shall furnish sufficient forces to ensure the prosecution of the Work in accordance with the Construction Schedule.

8.2.2 PERFORMANCE DURING WORKING HOURS

Work shall be performed during regular working hours except that in the event of an emergency or when required to perform the Work in accordance with job progress, Work may be performed outside of regular working hours with the advance written consent of the Owner.

8.2.3 LABOR CODE APPLICATION

As provided in Article 3 (commencing at § 1810), Chapter 1, Part 7, Division 2 of the Labor Code, eight (8) hours of labor shall constitute a legal day's work. The time of service of any worker employed at any time by the Contractor or by any Subcontractor on any subcontract under this Contract, upon the Work or upon any part of the Work contemplated by this Contract, is limited and restricted to eight (8) hours during any one calendar day and forty (40) hours during any one calendar week, except as hereinafter provided. Notwithstanding the provision hereinabove set forth, Work performed by employees of Contractors in excess of eight (8) hours per day and forty (40) hours during any one week shall be permitted upon this public work with

compensation provided for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1-1/2) times the basic rate of pay.

Contractor or subcontractor shall pay to the Owner a penalty of Twenty-five Dollars ($25.00) for each worker employed in the execution of this Contract by the Contractor, or by any Subcontractor, for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any calendar day and forty (40) hours in any one (1) calendar week, in violation of the provisions of Article 3 (commencing at § 1810), Chapter 1, Part 7, Division 2 of the Labor Code, unless compensation for the workers so employed by Contractor is not less than one and one-half (1-1/2) times the basic rate of pay for all hours worked in excess of eight (8) hours per day.

8.2.4 COSTS FOR AFTER HOURS INSPECTIONS

If the work done after hours is required by the Contract Documents to be done outside the Contractor's or the Inspector of Record's regular working hours, the costs of any inspections, if required to be done outside normal working hours, shall be borne by the Owner.

If the Owner allows the Contractor to do work outside regular working hours for the Contractor's own convenience, the costs of any inspections required outside regular working hours, among other remedies, shall be invoiced to the Contractor by the Owner and withheld from progress payments and/or retention. Contractor shall give Owner at least 48 hours notice prior to working outside regular working hours.

If the Contractor elects to perform work outside the Inspector of Record's regular working hours, costs of any inspections required outside regular working hours, among other remedies, may be invoiced to the Contractor by the Owner and withheld from progress payments and/or retention.

8.2.5 TIME FOR COMMENCEMENT BY SUBCONTRACTORS

Unless otherwise provided in the Contract Documents, all Subcontractors shall commence their Work within two (2) consecutive business days after notice to them by the Contractor and shall prosecute their Work in accordance with the progress of the Work.

8.3 PROGRESS AND COMPLETION

8.3.1 TIME OF THE ESSENCE

Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Milestone Deadlines and Contract Time are reasonable periods for performing the Work.

8.3.2 NO COMMENCEMENT WITHOUT INSURANCE

The Contractor shall not knowingly, except by agreement or instruction of the Owner, in writing, commence operations on the Site or elsewhere prior to the effective date of insurance required by

Article 11 to be furnished by the Contractor. The date of commencement of the Work shall not be changed by the effective date of such insurance.

8.3.3 EXPEDITIOUS COMPLETION

The Contractor shall proceed expeditiously to perform the Work, with adequate forces, labor, materials, equipment, services and management, shall achieve all Milestone Deadlines, and shall achieve Completion within the Contract Time.

8.4 EXTENSIONS OF TIME - LIQUIDATED DAMAGES

8.4.1 CONDITIONS ALLOWING FOR EXTENSIONS OF TIME TO COMPLETE THE WORK, ONLY (EXCUSABLE DELAY)

The Contractor shall be granted a reasonable time extension for excusable delays, which are those delays that meet each and every of the following conditions:

(a) The delay was beyond the control of Contractor and its subcontractors and material suppliers;

(b) The delay was caused by events about which Contractor was not advised at or before the time of bidding;

(c) The delay impacted and delayed (i) the controlling items of Work (i.e., the as-built critical path, as determined from the as-planned schedule and the actual progress of the Work), or (ii) the achievement of a Milestone Deadline, or the Completion of the whole Work within the Contract Time;

(d) The delay was not caused by Contractor or its subcontractors or suppliers, including but not limited to their breaches of contract or the standard of care;

(e) The delay was not associated with loss of time resulting from the necessity of submittals to Owner for approval, or from necessary Owner surveys, measurements, inspections and testing;

(f) The delay was not caused by usual or common weather for the time of year, including usual or common severe weather; and

(g) The delay could not have been be prevented by the exercise of care, prudence, foresight, and diligence by Contractor.

Excusable delays may include acts of God, acts of public enemy, acts of the Owner or anyone employed by it, acts of another contractor in performance of a contract (other than this Contract) with the Owner, fires, floods, epidemics, quarantine restrictions, labor disputes, unusually and uncommonly severe weather for the time of year, unforeseen site conditions, or delays of subcontractors due to such causes. Owner shall take into consideration other relevant factors such as concurrent delays. Contractor has the burden of proving that any delay was excusable.

8.4.2 COMPENSABLE DELAY (TIME AND MONEY)

Compensable delays are those excusable delays for which Contractor is also entitled to money. To be compensable, an excusable delay must be one for which the Owner is responsible, where the delay was unreasonable under the circumstances involved, and where the delay was not

within the contemplation of the parties; ***however***, Contractor shall not be entitled to monetary compensation when (a) Contractor could have reasonably anticipated the delay and avoided or minimized the cost impacts of it, (b) there was a concurrent delay which does not qualify for monetary compensation under this paragraph, (c) the cause of the delay was reasonably unforeseen by the Owner or the delay was caused by factors beyond the control of the Owner, including but not limited to a delay under Section 2.2.8 above or a delay caused by a utility company's failure to perform despite Owner's reasonable arrangements for such performance; or (d) any other defense available to Owner under law or equity applies. Contractor has the burden of proving that any delay was excusable and compensable, including an analysis that establishes non-concurrency.

8.4.3 NOTICE BY CONTRACTOR REQUIRED; PROCEDURES FOR DEMANDING ADDITIONAL TIME OR MONEY

For notice and other required procedures related to requests by Contractor for additional time or money related to delay, Contractor shall comply with the Contract Documents, including but not limited to Sections 3.18 and 4.5, and Article 7, above.

8.4.4 EARLY COMPLETION

Regardless of the cause therefore, the Contractor may not maintain any Claim or cause of action against the Owner for damages incurred as a result of its failure or inability to Complete its Work on the Project in a shorter period than established in the Contract Documents, the parties stipulating that the period set forth in the Contract Documents is a reasonable time within which to perform the Work on the Project.

8.4.5 LIQUIDATED DAMAGES

Failure to Complete the Work within the Contract Time and in the manner provided for by the Contract Documents, or failure to complete any specified portion of the Work by a milestone deadline, shall subject the Contractor to liquidated damages as described in Article III of the Agreement and the Contract Documents. Accordingly, the parties agree that the amount set forth in the Agreement shall be presumed to be the amount of damages which the Owner shall directly incur as a result of each calendar day by which Completion of the Work is delayed beyond the Contract Time as adjusted by Change Orders.

In addition, delaying another contractor's work on the Project or causing delay to the *completion* of the Project shall subject the Contractor to liquidated damages as described in Article III of the Agreement and the Contract Documents. Accordingly, the parties agree that the amount set forth in the Agreement shall be presumed to be the amount of damages which the Owner shall directly incur as a result of each calendar day by which Contractor delays the work of others on the Project or *completion* of the Project itself.

If liquidated damages accrue as described above, the Owner, in addition to all other remedies provided by law, shall have the right to assess and withhold as provided in Article III of the Agreement and the Contract Documents.

8.5 GOVERNMENT APPROVALS

Owner shall not be liable for any delays or damages related to the time required to obtain government approvals.

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement, later adjusted by Change Orders and Construction Change Directives, and is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

9.2 COST BREAKDOWN

9.2.1 REQUIRED INFORMATION

On forms approved by the Owner, the Contractor shall furnish the following:

A. Within ten (10) days of the mailing, faxing or delivering of the Notice of Award of the Contract, a detailed breakdown of the Contract Sum (Schedule of Values) for each Project or Site. Each item in the schedule of values shall include its proper share of the overhead and profit.

B. Within ten (10) days of the mailing, faxing or delivering of the Notice of Award of the Contract, a schedule of estimated monthly payment requests (cash flow) due the Contractor showing the values and construction time of the various portions of the Work to be performed by it and by its Subcontractors or material and equipment suppliers containing such supporting evidence as to its correctness as the Owner may require;

C. Five (5) days prior to the submission of a pay request, an itemized breakdown of work done for the purpose of requesting partial payments;

D. Within ten (10) days of the mailing, faxing or delivering of the Notice of Award of the Contract, the name, address, telephone number, fax number, license number, and classification of all of its Subcontractors and of all other parties furnishing labor, material, or equipment for its Contract, along with the amount of each such subcontract or the price of such labor, material, and equipment needed for its entire portion of the Work.

9.2.2 **OWNER ACCEPTANCE REQUIRED**

The Owner shall review all submissions received pursuant to paragraph 9.2.1 in a timely manner. All submissions must be accepted by the Owner before becoming the basis of any payment.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 **PROCEDURE**

On or before the fifth (5th) day of each calendar month during the progress of the portion of the Work for which payment is being requested, the Contractor shall submit to the Architect, unless there is a construction manager for the Project or the Owner directs otherwise, an itemized Application for Payment for operations completed in accordance with the Schedule of Values through the end of the previous calendar month. Such application shall be notarized, if required, and supported by the following or such portion thereof as the applicable entity requires:

A. The amount paid to the date of the Application to the Contractor, to all its Subcontractors, and all others furnishing labor, material, or equipment for its Contract;

B. The amount being requested with the Application for Payment by the Contractor on its own behalf and separately stating the amount requested on behalf of each of the Subcontractors and all others furnishing labor, material, and equipment under the Contract;

C. The balance that will be due to each of such entities after said payment is made;

D. A certification that the Record Drawings and Annotated Specifications are current;

E. The Owner approved additions to and subtractions from the Contract Sum and Time;

F. A summary of the retentions (each Application shall provide for retention, as set out in Article 9.6);

G. Material invoices, evidence of equipment purchases, rentals, and other support and details of cost as the Owner may require from time to time;

H. The percentage of Completion of the Contractor's Work by line item;

I. A statement showing all payments made by the Contractor for labor and materials on account of the Work covered in the preceding Application for Payment. Such applications shall not include requests for payment of amounts the Contractor does not intend to pay to subcontractors or others because of a dispute or other reason; and

J. Contractor's monthly reports, daily reports, and monthly schedule updates for all months of Work prior to the Application for Payment that Contractor has not previously submitted.

9.3.2 PURCHASE OF MATERIALS AND EQUIPMENT

As the Contractor is required to order, obtain, and store materials and equipment sufficiently in advance of its Work at no additional cost or advance payment from Owner, to assure that there will be no delays, payment by the Owner for stored material shall be made only in unusual circumstances where the Architect specifically recommends, and Owner specifically approves the payment in writing. If payments are to be made on account of materials and equipment not incorporated in the Work, but delivered and suitably stored at the Site or at some other location agreed upon in writing by the Owner, the payments shall be conditioned upon submission by the Contractor, Subcontractor, or vendor of bills of sale and such other documents satisfactory to the Owner to establish the Owner's title to such materials or equipment free of all liens and encumbrances, and otherwise protect the Owner's interest, including, without limitation, provision of applicable insurance and transportation to the Site. All stored items shall be inventoried, specified by identification numbers (if applicable), released to the Owner by sureties of the Contractor and the Subcontractor and, if stored off-Site, stored only in a bonded warehouse.

9.3.3 WARRANTY OF TITLE

The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances in favor of the Contractor, Subcontractors, material and equipment suppliers, or other persons or entities making a claim by reason of having provided labor, materials, and equipment relating to the Work. Transfer of title to Work does not constitute a waiver by Owner of any defects in the Work.

9.4 REVIEW OF PROGRESS PAYMENT

9.4.1 OWNER ACCEPTANCE

The Owner will, within seven (7) days after receipt of the Contractor's Application for Payment, either accept such payment or notify the Contractor in writing of the Owner's reasons for withholding acceptance in whole or in part as provided in paragraph 9.5.1.

9.4.2 OWNER'S REVIEW

The review of the Contractor's Application for Payment by the Owner will be based, at least in part, on the Owner's observations at the Site and the data comprising the Application for

Payment that the Work has progressed to the point indicated. The review is also subject to an evaluation of the Work for conformance with the Contract Documents, to results of subsequent tests and inspections, to minor deviations from the Contract Documents correctable prior to Completion, and to specific qualifications expressed by the Owner. The Owner may reject the Application for Payment if it is not complete under section 9.3. The issuance of a Certificate for Payment will constitute a representation that the Contractor is entitled to payment in the amount certified, subject to any specific qualifications Owner expresses in the Certificate for Payment. However, Contractor's entitlement to payment may be affected by subsequent evaluations of the Work for conformance with the Contract Documents, test and inspections and discovery of minor deviations from the Contract Documents correctable prior to Completion. The issuance of a Certificate for Payment will not be a waiver by the Owner of any defects in the Work covered by the Application for Payment, nor will it be a representation that the Owner has:

A. Made exhaustive or continuous on-Site inspections to check the quality or quantity of the Work;

B. Reviewed construction means, methods, techniques, sequences, or procedures;

C. Reviewed copies of requisitions received from Subcontractors, material and equipment suppliers, and other data requested by the Owner to substantiate the Contractor's right to payment; or

D. Made an examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

9.5 DECISIONS TO WITHHOLD PAYMENT

9.5.1 REASONS TO WITHHOLD PAYMENT

The Owner may withhold from a progress payment, in whole or in part, to such extent as may be necessary to protect the Owner due to any of the following:

A. Defective or incomplete Work not remedied;

B. Stop Payment Notices. For any stop payment notice, the Owner shall withhold the amount stated in the stop payment notice, the stop notice claimant's anticipated interest and court costs and an amount to provide for the public entity's reasonable cost of any litigation pursuant to the stop payment notice. For any stop payment notice action the parties resolve before judgment is entered, Owner has the right to permanently withhold for any reasonable cost of litigation for that stop payment notice, even if it exceeds the amount originally withheld by Owner for the estimated reasonable cost of litigation. However, if (1) the Contractor at its sole expense provides a bond or other security satisfactory to the Owner in the amount of at least one hundred twenty-five percent (125%) of the claim, in a form satisfactory to the Owner, which protects the Owner against such claim, and (2) the Owner chooses to accept the bond, then Owner would release the withheld

stop payment notice funds to the Contractor, except that Owner may permanently withhold for any reasonable cost of litigation. Any stop payment notice release bond shall be executed by a California admitted, fiscally solvent surety, completely unaffiliated with and separate from the surety on the payment and performance bonds, that does not have any assets pooled with the payment and performance bond sureties.

C. Liquidated damages against the Contractor, whether already accrued or estimated to accrue in the future;

D. Reasonable doubt that the Work can be Completed for the unpaid balance of any Contract Sum or within the Contract Time;

E. Damage to the property or work of the Owner, another contractor, or subcontractor;

F. Unsatisfactory prosecution of the Work by the Contractor;

G. Failure to store and properly secure materials;

H. Failure of the Contractor to submit on a timely basis, proper and sufficient documentation required by the Contract Documents, including, without limitation, monthly progress schedules, shop drawings, submittal schedules, schedule of values, product data and samples, proposed product lists, executed change orders, and verified reports;

I. Failure of the Contractor to maintain record drawings;

J. Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment;

K. Unauthorized deviations from the Contract Documents;

L. Failure of the Contractor to prosecute the Work in a timely manner in compliance with established progress schedules and Completion deadlines;

M. Subsequently discovered evidence or observations nullifying the whole or part of a previously issued Certificate for Payment;

N. Failure by Contractor to pay Subcontractors or material suppliers as required by Contract or law, which includes but is not limited to Contractor's failure to pay prevailing wage and any assessment of statutory penalties;

O. Overpayment to Contractor on a previous payment;

P. Credits owed to Owner for reduced scope of work or work that Contractor will

not perform, including credits for any unspent contingency fund or allowances;

Q. The estimated cost of performing work pursuant to Section 2.4;

R. Actual damages related to false claims by Contractor;

S. Breach of any provision of the Contract Documents;

T. Owner's potential or actual loss, liability or damages caused by the Contractor; and

U. As permitted by other provisions in the Contract or as otherwise allowed by law, including statutory penalties Owner or other entities assessed against Contractor. (See e.g., Labor Code section 1813 (working hours) or Public Contract Code section 4110 (subcontractor listings and substitutions))

Owner may, but is not required to, provide to Contractor with the progress payment written notice of the items for which Owner is withholding amounts from the payment. To claim wrongful withholding by the Owner, or if Contractor otherwise disputes any amount being withheld, Contractor must submit an inquiry in writing to Owner within thirty (30) days of receipt of the notice, and Owner shall respond within fifteen (15) days of receipt of the inquiry. If any disputed issues remain unresolved after Owner's response, Contractor shall timely submit a Claim pursuant to Section 4.5.

For any withhold amount based on an estimate where the actual amount later becomes known and certain, no later than the final accounting for the Contract the Owner will release any amount withheld over that certain and known amount. If the certain and known amount exceeds the amount previously withheld, Owner may withhold additional amounts from Contractor to cover the excess amount. If available funds are not sufficient, Contractor shall pay Owner the difference.

9.5.2 PAYMENT AFTER CURE

When Contractor removes or cures the grounds for withholding amounts, payment shall be made for amounts withheld because of them. No interest shall be paid on any retainage or amounts withheld due to the failure of the Contractor to perform in accordance with the terms and conditions of the Contract Documents.

9.5.3 OVERPAYMENT AND/OR FAILURE TO WITHHOLD

Neither Owner's overpayment to Contractor, nor Owner's failure to withhold an amount from payment that Owner had the right to withhold, shall constitute a waiver by Owner of its rights to withhold those amounts from future payments to Contractor or to otherwise pursue recovery of those amounts from Contractor.

9.6 PROGRESS PAYMENTS

9.6.1 PAYMENTS TO CONTRACTOR

Unless otherwise stated in the Contract Documents, within thirty (30) days after receipt of an undisputed and properly submitted Application for Payment, Contractor shall be paid a sum equal to ninety-five percent (95%) of the undisputed value of the Work performed up to the last day of the previous month, less the aggregate of previous payments; and Owner shall retain the other five percent (5%) of the undisputed value of the Work. The value of the Work completed shall be an estimate only, no inaccuracy or error in said estimate shall operate to release the Contractor, or any bondsman, from damages arising from such Work or from enforcing each and every provision of this Contract, and the Owner shall have the right subsequently to correct any error made in any estimate for payment. Contractor shall base an Application for Payment only on the original Contract Sum plus any fully executed and Board-approved Change Orders. Contractor shall not include Notices of Potential Claims, CORs, Claims or disputed amounts.

The Contractor shall not be entitled to have any payment requests processed, or be entitled to have any payment made for work performed, so long as any lawful or proper direction given by the Owner concerning the Work, or any portion thereof, remains uncomplied with. Payment shall not be a waiver of any such direction.

9.6.2 PAYMENTS TO SUBCONTRACTORS

No later than ten (10) days after receipt of payment from Owner, pursuant to Business and Professions Code section 7108.5, the Contractor shall pay to each Subcontractor, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

9.6.3 PERCENTAGE OF COMPLETION OR PAYMENT INFORMATION

The Owner will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of Completion or amounts applied for by the Contractor, and action taken thereon by the Owner, on account of portions of the Work done by such Subcontractor.

9.6.4 NO OBLIGATION OF OWNER FOR SUBCONTRACTOR PAYMENT

The Owner shall have no obligation to pay, or to see to the payment of, money to a Subcontractor except as may otherwise be required by law.

9.6.5 PAYMENT TO SUPPLIERS

Payment to material or equipment suppliers shall be treated in a manner similar to that provided

in paragraphs 9.6.2, 9.6.3 and 9.6.4.

9.6.6 PAYMENT NOT CONSTITUTING APPROVAL OR ACCEPTANCE

An accepted Application for Payment, issuance of a Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance or approval of any portion of the Work, especially any Work not in accordance with the Contract Documents.

9.6.7 JOINT CHECKS

Owner shall have the right, if necessary for the protection of the Owner, to issue joint checks made payable to the Contractor and Subcontractors and/or material or equipment suppliers. The joint check payees shall be responsible for the allocation and disbursement of funds included as part of any such joint payment. However, Owner has no duty to issue joint checks. In no event shall any joint check payment be construed to create any contract between the Owner and a Subcontractor of any tier, any obligation from the Owner to such Subcontractor, or rights in such Subcontractor against the Owner.

9.7 COMPLETION OF THE WORK

9.7.1 CLOSE-OUT PROCEDURES

When the Contractor considers that the Work is Complete and submits a written notice to Owner requesting an inspection of the Work, the Owner shall review the Work and prepare and submit to the Contractor a comprehensive list of items to be Completed or corrected (the "Punch List"). The Punch List shall include all outstanding obligations of Contractor, including training, start-up, testing, and submission to Owner of all required documentation (e.g., written guarantees, warranties, invoices, as-built drawings, manuals, bonds, and the documents described in Sections 9.3 and 9.9). The Contractor and/or its Subcontractors shall proceed promptly to Complete and correct items on the Punch List. Failure to include an item on the Punch List does not alter the responsibility of the Contractor to Complete all Work (including the omitted item) in accordance with the Contract Documents, and to Complete or correct the Work so long as the statute of limitations (or repose) has not run.

When the Contractor believes the Punch List Work is Complete and in accordance with the Contract Documents, it shall then submit a request for an additional inspection by the Owner to determine Completion. Owner shall again inspect the Work and inform the Contractor of any items that are not complete or correct. Contractor shall promptly Complete or correct items until no items remain.

After the Work, including all Punch List Work, is inspected and informally deemed by the Owner to be Complete, the Owner's governing body may formally accept the Work as Complete at a meeting of the governing body. Warranties required by the Contract Documents shall commence on the date of Contractor's Completion of the Work (see Sections 3.5, 12.2.5, and 12.2.6).

9.7.2 COSTS OF MULTIPLE INSPECTIONS

More than two (2) requests by Contractor to make inspections to confirm Completion as required under paragraph 9.7.1 shall be considered an additional service of Owner, and all subsequent costs will be invoiced to Contractor and withheld from remaining payments.

9.8 PARTIAL OCCUPANCY OR USE

The Owner may occupy or use any completed, or partially completed, portion of the Work at any stage prior to acceptance, or prior to Completion if there is no formal acceptance. Occupancy or use of any portion of the Work, or the whole Work, shall not constitute approval or acceptance of it, nor shall such occupancy or use relieve Contractor of any of its obligations under the Contract Documents regarding that portion of, or the whole, Work.

The Owner and the Contractor shall agree in writing to the responsibilities assigned to each of them for payments, security, maintenance, heat, utilities, damage to the Work, insurance, the period for correction of the Work, and the commencement of warranties required by the Contract Documents. When the Contractor considers a portion complete, the Contractor may request an inspection of that portion and preparation of a Punch List by the Owner for that portion, as set forth for the entire Work under paragraph 9.7.1; however, such inspection and Punch List shall not act as any form of approval or acceptance of that portion of the Work, or of any Work not complying with the requirements of the Contract, and that portion shall be subject to subsequent inspections and Punch Lists.

Immediately prior to such partial occupancy or use, the Owner, the Architect and the Contractor shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

9.9 FINAL PROGRESS PAYMENT AND RELEASE OF RETENTION

9.9.1 FINAL APPLICATION FOR PROGRESS PAYMENT

When, pursuant to Section 9.7.1, the Owner finds all of the Work is Completed in accordance with the Contract Documents, it shall so notify Contractor, who shall then submit to the Owner its final Application for Payment.

Upon receipt and approval of such final Application for Payment, the Owner shall issue a final Certificate of Payment, based on its knowledge, information, and belief, and on the basis of its observations, inspections, and all other data accumulated or received by the Owner in connection with the Work, that such Work has been Completed in accordance with the Contract Documents.

9.9.2 PROCEDURES FOR APPLICATION FOR FINAL PROGRESS PAYMENT

The Application for Final Progress Payment pursuant to Section 9.9.1 shall be accompanied by the same details as set forth in paragraph 9.3, and in addition, the following conditions must be

fulfilled:

A. The Work shall be Complete, and the Contractor shall have made, or caused to have been made, all corrections to the Work which are required to remedy any defects therein, to obtain compliance with the Contract Documents or any requirements of applicable codes and ordinances, or to fulfill any of the orders or directions of Owner required under the Contract.

B. Each Subcontractor shall have delivered to the Contractor all written guarantees, warranties, applications, and bonds required by the Contract Documents for its portion of the Work, and Contractor delivered them to the Owner.

C. The Contractor shall deliver to the Owner (i) reproducible final Record Drawings and Annotated Specifications showing the Contractor's Work "as built," with the Contractor's certification of the accuracy of the Record Drawings and Annotated Specifications, (ii) all warranties and guarantees, (iii) operation and maintenance instructions, manuals and materials for equipment and apparatus, and (iv) all other documents required by the Contract Documents.

D. Contractor shall provide extensive assistance in the utilization of any equipment or system such as initial start-up or testing, adjusting and balancing, preparation of operation and maintenance manuals and training personnel for operation and maintenance.

Acceptance of Final Progress Payment shall constitute a complete waiver of Claims except for those previously identified in writing and identified by that payee as unsettled at the time of Final Progress Payment.

9.9.3 **RELEASE OF RETAINAGE**

Owner may withhold from release or payment of retainage (or "retention") up to 150% of disputed amounts listed in Section 9.5. If retainage is held in an escrow account pursuant to an escrow agreement under Public Contract Code section 22300 (see Section 9.10) and Owner withholds from release of retainage based on a breach of the Contract, or other default, by Contractor, Owner may withdraw the withheld retainage from the escrow account. Owner shall release the undisputed retainage within sixty (60) days after Completion of the Work. For this purpose, "Completion" is defined in Public Contract Code section 7107(c). No interest shall be paid on any retainage, or on any amounts withheld, except as provided to the contrary in any Escrow Agreement and General Conditions between the Owner and the Contractor under Public Contract Code section 22300.

9.10 **SUBSTITUTION OF SECURITIES**

In accordance with section 22300 of the Public Contract Code, the Owner will permit the substitution of securities for any retention monies withheld by the Owner to ensure performance under the Contract. At the request and expense of the Contractor, securities equivalent to the

amount withheld shall be deposited with the Owner, or with a state or federally chartered bank as the escrow agent, who shall then pay such retention monies to the Contractor. Upon Completion of the Contract, the securities shall be returned to the Contractor if Owner has no basis to withhold under the Contract Documents.

Securities eligible for investment under this section shall include those listed in Government Code section 16430, bank or savings and loan certificates of deposit, interest-bearing, demand-deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and the Owner.

The Contractor shall be the beneficial owner of any securities substituted for monies withheld and shall receive any interest thereon.

Any escrow agreement entered by Owner and Contractor pursuant to Public Contract Code section 22300, shall be substantially similar to the form set forth in Public Contract Code section 22300.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 CONTRACTOR RESPONSIBILITY

The Contractor shall have responsibility for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. Each Contractor shall designate a responsible member of its organization whose duties shall include loss and accident prevention, and who shall have the responsibility and full authority to enforce the program. This person shall attend meetings with the representatives of the various Subcontractors employed to ensure that all employees understand and comply with the programs. Contractor will ensure that his employees and Subcontractors cooperate and coordinate safety matters with any other contractors on the Project to form a joint safety effort.

10.1.2 SUBCONTRACTOR RESPONSIBILITY

Subcontractors have the responsibility for participating in, and enforcing, the safety and loss prevention programs established by the Contractor for the Project, which will cover all Work performed by the Contractor and its Subcontractors. Each Subcontractor shall designate a responsible member of its organization whose duties shall include loss and accident prevention, and who shall have the responsibility and full authority to enforce the program. This person shall attend meetings with the representatives of the various Subcontractors employed to ensure that all employees understand and comply with the programs.

10.1.3 COOPERATION

All Subcontractors and material or equipment suppliers, shall cooperate fully with Contractor, the Owner, and all insurance carriers and loss prevention engineers.

10.1.4 ACCIDENT REPORTS

Subcontractors shall promptly report in writing to the Contractor all accidents whatsoever arising out of, or in connection with, the performance of the Work, whether on or off the Site, which caused death, personal injury, or property damage, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger. Contractor shall thereafter promptly report the facts in writing to the Owner giving full details of the accident.

10.1.5 FIRST-AID SUPPLIES AT SITE

The Contractor will provide and maintain at the Site first-aid supplies for minor injuries.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 THE CONTRACTOR

The Contractor shall take reasonable precautions for the safety of, and shall provide reasonable protection to prevent damage, injury, or loss to:

A. Employees on the Work and other persons who may be affected thereby;

B. The Work, material, and equipment to be incorporated therein, whether in storage on or off the Site, under the care, custody, or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and

C. Other property at the Site or adjacent thereto such as trees, shrubs, lawns, walks, pavement, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

10.2.2 CONTRACTOR NOTICES

The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on the safety of persons or property or their protection from damage, injury, or loss.

10.2.3 SAFETY BARRIERS AND SAFEGUARDS

The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users

of adjacent sites and utilities.

10.2.4 USE OR STORAGE OF HAZARDOUS MATERIAL

When use or storage of explosives, other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. The Contractor shall notify the Owner any time that explosives or hazardous materials are expected to be stored on Site. Location of storage shall be coordinated with the Owner and local fire authorities.

10.2.5 FINGERPRINTING

At its own expense, Contractor shall comply with all fingerprinting requirements under law and Contract, including but not limited to the requirements of Education Code section 45125.2 and the Independent Contractor Student Contact Form which is a part of the Contract. Contractor shall hold harmless, defend and indemnify the Owner under section 3.16, for any costs, including attorneys' fees, Owner incurs from Contractor's failure to comply.

10.3 PROTECTION OF WORK AND PROPERTY

10.3.1 PROTECTION OF WORK

The Contractor and Subcontractors shall continuously protect the Work, the Owner's property, and the property of others, from damage, injury, or loss until the earlier of formal acceptance of the Work or Completion of the Work. The Contractor and Subcontractors shall make good any such damage, injury, or loss, except such as may be solely due to, or caused by, agents or employees of the Owner.

10.3.2 PROTECTION FOR ELEMENTS

The Contractor will remove all mud, water, or other elements as may be required for the proper protection and prosecution of its Work. The Contractor shall at all times provide heat, coverings, and enclosures necessary to maintain adequate protection against weather so as to preserve the Work, materials, equipment, apparatus, and fixtures free from injury or damage.

10.3.3 SHORING AND STRUCTURAL LOADING

The Contractor shall not impose structural loading upon any part of the Work under construction or upon existing construction on or adjacent to the Site in excess of safe limits, or loading such as to result in damage to the structural, architectural, mechanical, electrical, or other components of the Work. The design of all temporary construction equipment and appliances used in construction of the Work and not a permanent part thereof, including, without limitation, hoisting equipment, cribbing, shoring, and temporary bracing of structural steel, is the sole responsibility of the Contractor. All such items shall conform to the requirements of governing codes and all laws, ordinances, rules, regulations, and orders of all authorities having jurisdiction. The Contractor shall take special precautions, such as shoring of masonry walls and temporary tie

bracing of structural steel work, to prevent possible wind damage during construction of the Work. The installation of such bracing or shoring shall not damage or cause damage to the Work in place or the Work installed by others. Any damage which does occur shall be promptly repaired by the Contractor at no cost to the Owner.

10.3.4 CONFORMANCE WITHIN ESTABLISHED LIMITS

The Contractor and Subcontractors shall confine their construction equipment, the storage of materials, and the operations of workers to the limits indicated by laws, ordinances, permits, and the limits established by the Owner, and shall not unreasonably encumber the premises with construction equipment or materials.

10.3.5 SUBCONTRACTOR ENFORCEMENT OF RULES

Subcontractors shall enforce the Owner's and the Contractor's instructions, laws, and regulations regarding signs, advertisements, fires, smoking, the presence of liquor, and the presence of firearms by any person at the Site.

10.3.6 SITE ACCESS

The Contractor and the Subcontractors shall use only those ingress and egress routes designated by the Owner, observe the boundaries of the Site designated by the Owner, park only in those areas designated by the Owner, which areas may be on or off the Site, and comply with any parking control program established by the Owner such as furnishing license plate information and placing identifying stickers on vehicles.

10.3.7 PROTECTION OF MATERIALS

The Contractor and the Subcontractors shall receive, count, inspect for damage, record, store, and protect construction materials for the Work and Subcontractors shall promptly send to the Contractor evidence of receipt of such materials, indicating thereon any shortage, change, or damage (failure to so note shall constitute acceptance by the Subcontractor of financial responsibility for any shortage).

10.4 EMERGENCIES

10.4.1 EMERGENCY ACTION

In an emergency affecting the safety of persons or property, the Contractor shall take any action necessary, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional money or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Section 4.5 and Article 7.

10.4.2 ACCIDENT REPORTS

The Contractor shall promptly report in writing to the Owner all accidents arising out of or in

connection with the Work, which caused death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported immediately by telephone or messenger to the Owner.

10.5 HAZARDOUS MATERIALS

10.5.1 DISCOVERY OF HAZARDOUS MATERIALS

In the event the Contractor encounters or suspects the presence on the Site material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), or any other material defined as being hazardous by section 25249.5 of the California Health and Safety Code, which (a) has not been rendered harmless, and (b) the handling or removal of which is not within the scope of the Work, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner and the Architect in writing, whether such material was generated by the Contractor, another contractor, or the Owner. The Work in the affected area shall not thereafter be resumed, except by written agreement of the Owner and the Contractor, if in fact the material is asbestos, polychlorinated biphenyl (PCB), or other hazardous material, and has not been rendered harmless. The Work in the affected area shall be resumed only in the absence of asbestos, polychlorinated biphenyl (PCB), or other hazardous material, or when it has been rendered harmless by written agreement of the Owner and the Contractor.

10.5.2 HAZARDOUS MATERIAL WORK LIMITATIONS

In the event that the presence of hazardous materials is suspected or discovered on the Site, the Owner shall retain an independent testing laboratory to determine the nature of the material encountered and whether corrective measures or remedial action is required. The Contractor shall not be required pursuant to Article 7 to perform without consent any Work in the affected area of the Site relating to asbestos, polychlorinated biphenyl (PCB), or other hazardous material, until any known or suspected hazardous material has been removed, or rendered harmless, or determined to be harmless by Owner, as certified by an independent testing laboratory and/or approved by the appropriate government agency.

10.5.3 INDEMNIFICATION BY OWNER FOR HAZARDOUS MATERIAL NOT CAUSED BY CONTRACTOR

In the event the presence of hazardous materials on the Site is not caused by the Contractor, Owner shall pay for all costs of testing and remediation, if any, and shall compensate Contractor for any delay or additional costs incurred in accordance with the applicable provisions of Articles 7 and 8 herein. Owner shall defend, indemnify and hold harmless the Contractor and its agents, officers, directors and employees from and against any and all claims, damages, losses, costs and expenses incurred in connection with or arising out of, or relating to, the performance of the Work in the area affected by the hazardous material, except to the extent the claims, damages, losses, costs, or expenses were caused by Contractor's active negligence, sole negligence or willful misconduct. By providing this indemnification, Owner does not waive any immunities.

10.5.4 INDEMNIFICATION BY CONTRACTOR FOR HAZARDOUS MATERIAL CAUSED BY CONTRACTOR

In the event the presence of hazardous materials on the Site is caused by Contractor, Subcontractors, materialmen or suppliers, the Contractor shall pay for all costs of testing and remediation, if any, and shall compensate the Owner for any additional costs incurred as a result of the generation of hazardous material on the Project Site. In addition, the Contractor shall defend, indemnify and hold harmless Owner and its agents, officers, and employees from and against any and all claims, damages, losses, costs and expenses incurred in connection with, arising out of, or relating to, the presence of hazardous material on the Site, except to the extent the claims, damages, losses, costs, or expenses were caused by Owner's active negligence, sole negligence or willful misconduct.

10.5.5 TERMS OF HAZARDOUS MATERIAL PROVISION

The terms of this Hazardous Material provision shall survive the Completion of the Work and/or any termination of this Contract.

10.5.6 ARCHEOLOGICAL MATERIALS

In the event the Contractor encounters or reasonably suspects the presence on the Site of archeological materials, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner and the Architect in writing. The Work in the affected area shall not thereafter be resumed, except after Contractor's receipt of written notice form the Owner.

ARTICLE 11

INSURANCE AND BONDS

11.1. CONTRACTOR'S LIABILITY INSURANCE

11.1.1 LIABILITY INSURANCE REQUIREMENTS

11.1.1 By the earlier of the deadline set forth in the Instructions to Bidders or the commencement of the Work and within limits acceptable to the Owner, the Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in California as admitted carriers with a financial rating of at least A+, Class XII status as rated in the most recent edition of Best's Insurance Reports such commercial general liability insurance per occurrence for bodily injury, personal injury and property damage as set forth in the Agreement and automobile liability insurance per accident for bodily injury and property damage combined single limit as set forth in the Agreement as will protect the Contractor from claims set forth below, which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations are by the Contractor, by a Subcontractor, by Sub-subcontractor, by anyone directly or indirectly employed

by any of them, or by anyone for whose acts any of them may be liable:

11.1.1.1 claims for damages because of bodily injury (including emotional distress), sickness, disease, or death of any person other than the Contractor's employees. This coverage shall be provided in a form at least as broad as Insurance Services Office (ISO) Form CG 0001 11188;

11.1.1.2 claims for damages arising from personal or advertising injury in a form at least as broad as ISO Form CG 0001 11188;

11.1.1.3 claims for damages because of injury or destruction of tangible property, including loss of use resulting therefrom, arising from operations under the Contract Documents; and

11.1.1.4 claims for damages because of bodily injury, death of a person, or property damage arising out of the ownership, maintenance, or use of a motor vehicle, all mobile equipment, and vehicles moving under their own power and engaged in the Work; and

11.1.1.5 claims involving blanket contractual liability applicable to the Contractor's obligations under the Contract Documents, including liability assumed by and the indemnity and defense obligations of the Contractor and the Subcontractors; and

11.1.1.6 claims involving Completed Operations, Independent Contractors' coverage, and Broad Form property damage, without any exclusions for collapse, explosion, demolition, underground coverage, and excavating. (XCU)

If commercial general liability insurance or another insurance form with a general aggregate limit is used, either the general aggregate limit shall apply separately to the project location (with the ISO CG 2501 or insurer's equivalent endorsement provided to the Owner) or the general aggregate limit shall be twice the required occurrence limit.

Any deductible or self-insured retention must be declared to and approved by the Owner. At the option of the Owner, either the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Owner, its Board of Trustees, members of its Board of Trustees, officers, employees, agents and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

11.1.2 **SUBCONTRACTOR INSURANCE REQUIREMENTS**

The Contractor shall require its Subcontractors and any Sub-subcontractors to take out and maintain similar public liability insurance and property damage insurance, in a company or

companies lawfully authorized to do business in California as admitted carriers with a financial rating of at least A+, Class XII status as rated in the most recent edition of Best's Insurance Reports, in like amounts and scope of coverage.

11.1.3 OWNER'S INSURANCE

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance. Optionally, the Owner may purchase and maintain other insurance for self protection against claims which may arise from operations under the Contract. The Contractor shall not be responsible for purchasing and maintaining this optional Owner's liability insurance unless specifically required by the Contract Documents.

11.1.4 ADDITIONAL INSURED ENDORSEMENT REQUIREMENTS

The Contractor shall name, on any policy of insurance, the Owner and the Architect as additional insureds. Subcontractors shall name the Contractor, the Owner and the Architect as additional insureds. The Additional Insured Endorsement included on all such insurance policies shall state that coverage is afforded the additional insured with respect to claims arising out of operations performed by or on behalf of the insured. If the additional insureds have other insurance which is applicable to the loss, such other insurance shall be excess to any policy of insurance required herein. The amount of the insurer's liability shall not be reduced by the existence of such other insurance.

11.1.5 WORKERS' COMPENSATION INSURANCE

During the term of this Contract, the Contractor shall provide workers' compensation insurance for all of the Contractor's employees engaged in Work under this Contract on or at the Site of the Project and, in case any of the Contractor's work is sublet, the Contractor shall require the Subcontractor to provide workers' compensation insurance for all the Subcontractor's employees engaged in Work under the subcontract. Any class of employee or employees not covered by a Subcontractor's insurance shall be covered by the Contractor's insurance. In case any class of employees engaged in Work under this Contract on or at the Site of the Project is not protected under the Workers' Compensation laws, the Contractor shall provide or cause a Subcontractor to provide adequate insurance coverage for the protection of those employees not otherwise protected. The Contractor shall file with the Owner certificates of insurance as required under this Article and in compliance with Labor Code section 3700.

If the contractor fails to maintain such insurance, the Owner may take out compensation insurance which the Owner might be liable to pay under the provisions of the Act by reason of an employee of the Contractor being injured or killed, and withhold from progress payments and/or retention the amount of the premium for such insurance.

11.1.6 **BUILDER'S RISK/"ALL RISK" INSURANCE**

11.1.6.1 **COURSE-OF-CONSTRUCTION INSURANCE REQUIREMENTS**

Unless provided by Owner at Owner's sole discretion, Contractor, during the progress of the Work and until final acceptance of the Work by Owner upon Completion of the entire Contract, shall maintain Builder's Risk/Course-of-Construction insurance satisfactory to the Owner, issued on a completed value basis on all insurable Work included under the Contract Documents. This insurance shall insure against all risks, including but not limited to the following perils: vandalism, theft, malicious mischief, fire, sprinkler leakage, civil authority, sonic boom, explosion, collapse, flood, earthquake (for projects not solely funded through revenue bonds, limited to earthquakes equivalent to or under 3.5 on the Richter Scale in magnitude), wind, hail, lightning, smoke, riot or civil commotion, debris removal (including demolition) and reasonable compensation for the Architect's services and expenses required as a result of such insured loss. This insurance shall provide coverage in an amount not less than the full cost to repair, replace or reconstruct the Work. Such insurance shall include the Owner, the Architect, and any other person or entity with an insurable interest in the Work as an additional named insured.

The Contractor shall submit to the Owner for its approval all items deemed to be uninsurable under the Builder's Risk/Course-of Construction insurance. The risk of the damage to the Work due to the perils covered by the Builder's Risk/Course-of-Construction insurance, as well as any other hazard which might result in damage to the Work, is that of the Contractor and the surety, and no claims for such loss or damage shall be recognized by the Owner, nor will such loss or damage excuse the Complete and satisfactory performance of the Contract by the Contractor.

11.1.7 **CONSENT OF INSURER FOR PARTIAL OCCUPANCY OR USE**

Partial occupancy or use in accordance with the Contract Documents shall not commence until the insurance company providing property insurance has consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company and shall, without mutual consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of the insurance.

11.1.8 **FIRE INSURANCE**

Before the commencement of the Work, the Contractor shall procure, maintain, and cause to be maintained at the Contractor's expense, fire insurance on all Work included under the Contract Documents, insuring the full replacement value of such Work as well as the cost of any removal and demolition necessary to replace or repair all Work damaged by fire. The amount of fire insurance shall be subject to approval by the Owner and shall be sufficient to protect the Work against loss or damage in full until the Work is accepted by the Owner. Should the Work being constructed be damaged by fire or other causes during construction, it shall be replaced in accordance with the requirements of the drawings and specifications without additional expense to the Owner.

11.1.9 **OTHER INSURANCE**

The Contractor shall provide all other insurance required to be maintained under applicable laws, ordinances, rules, and regulations.

11.1.10 **PROOF OF CARRIAGE OF INSURANCE**

The Contractor shall not commence Work nor shall it allow any Subcontractor to commence Work under this Contract until all required insurance, certificates, and an Additional Insured Endorsement and Declarations Page have been obtained and delivered in duplicate to the Owner for approval subject to the following requirements:

(a) Certificates and insurance policies shall include the following clause:

> This policy shall not be non-renewed, canceled, or reduced in required limits of liability or amounts of insurance until notice has been mailed to the Owner. Date of cancellation or reduction may not be less than thirty (30) days after the date of mailing notice.

(b) Certificates of insurance shall state in particular those insured, the extent of insurance, location and operation to which the insurance applies, the expiration date, and cancellation and reduction notices.

(c) Certificates of insurance shall clearly state that the Owner and the Architect are named as additional insureds under the policy described and that such insurance policy shall be primary to any insurance or self-insurance maintained by Owner and any other insurance carried by the Owner with respect to the matters covered by such policy shall be excess and non-contributing.

(d) The Contractor and its Subcontractors shall produce a certified copy of any insurance policy required under this Section upon written request of the Owner.

11.1.11 **COMPLIANCE**

In the event of the failure of any contractor to furnish and maintain any insurance required by this Article, the Contractor shall be in default under the Contract. Compliance by Contractor with the requirement to carry insurance and furnish certificates, policies, Additional Insured Endorsement and Declarations Page evidencing the same shall not relieve the Contractor from liability assumed under any provision of the Contract Documents, including, without limitation, the obligation to defend and indemnify the Owner and the Architect.

11.2 PERFORMANCE AND PAYMENT BONDS

11.2.1 BOND REQUIREMENTS

Unless otherwise specified in the Contract Documents, prior to commencing any portion of the Work, the Contractor shall apply for and furnish Owner separate payment and performance bonds for its portion of the Work which shall cover 100% faithful performance of and payment of all obligations arising under the Contract Documents and/or guaranteeing the payment in full of all claims for labor performed and materials supplied for the Work. All bonds shall be provided by a corporate surety authorized and admitted to transact business in California. All bonds shall be submitted on the Owner's approved form.

To the extent, if any, that the Contract Sum is increased in accordance with the Contract Documents, the Contractor shall cause the amount of the bonds to be increased accordingly and shall promptly deliver satisfactory evidence of such increase to the Owner. To the extent available, the bonds shall further provide that no change or alteration of the Contract Documents (including, without limitation, an increase in the Contract Sum, as referred to above), extensions of time, or modifications of the time, terms, or conditions of payment to the Contractor will release the surety. If the Contractor fails to furnish the required bond, the Owner may terminate the Contract for cause.

11.2.2 SURETY QUALIFICATION

Only bonds executed by admitted Surety insurers as defined in Code of Civil Procedure section 995.120 shall be accepted. The surety insurers must, unless otherwise agreed to by Owner in writing, at the time of issuance of the bonds, have a rating not lower than "A-" as rated by A.M. Best Company, Inc. or other independent rating companies. Owner reserves the right to approve or reject the surety insurers selected by Contractor and to require Contractor to obtain bonds from surety insurers satisfactory to the Owner.

ARTICLE 12

UNCOVERING AND CORRECTION OF WORK

12.1 UNCOVERING OF WORK

12.1.1 UNCOVERING WORK FOR REQUIRED INSPECTIONS

If a portion of the Work is covered contrary to the Owner's request or to requirements specifically expressed in the Contract Documents, Contractor must, if required in writing by the Owner, uncover it for the Owner's observation and replace the removed work at the Contractor's expense without change in the Contract Sum or Time.

12.1.2 COSTS FOR INSPECTIONS NOT REQUIRED

If a portion of the Work has been covered which the Owner has not specifically requested to

observe prior to its being covered, the Owner may request to see such work, and it shall be uncovered by the Contractor. If such work is in accordance with the Contract Documents, costs of uncover and replacement shall, by appropriate Change Order, be paid by the Owner. If such work is not in accordance with Contract Documents, the Contractor shall pay such costs, unless the condition was caused by the Owner or a separate contractor, in which event the Owner shall be responsible for payment of such costs to the Contractor.

12.2 CORRECTION OF WORK; WARRANTY

12.2.1 CORRECTION OF REJECTED WORK

The Contractor shall promptly correct the work rejected by the Owner for failing to conform to the requirements of the Contract Documents, until the statutes of limitation (or repose) and all warranties have run, as applicable, and whether or not fabricated, installed or completed. The Contractor shall bear costs of correcting the rejected work, including additional testing, inspections, and compensation for the Owner's expenses and costs incurred.

12.2.2 REMOVAL OF NONCONFORMING WORK

The Contractor shall remove from the Site portions of the Work which are not in accordance with the requirements of the Contract Documents and are not corrected by the Contractor or accepted or approved by the Owner.

12.2.3 OWNER'S RIGHTS IF CONTRACTOR FAILS TO CORRECT

If the Contractor fails to correct nonconforming work within a reasonable time, the Owner may correct it in accordance with Section 2.4. As part of Owner's correction of the work, the Owner may remove any portion of the nonconforming Work and store any salvageable materials or equipment at the Contractor's expense. If the Contractor does not pay costs of such removal and storage within ten (10) days after written notice, the Owner may upon ten (10) additional days written notice sell such material or equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including compensation for the Architect's and other professionals and representatives' services and expenses, made necessary thereby. If such proceeds of sale do not cover costs which the Contractor should have borne, the Contractor shall be invoiced for the deficiency or Owner may withhold such costs from payment pursuant to Section 9.5. If progress payments or retention then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

12.2.4 COST OF CORRECTING THE WORK

The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or separate contractors, whether completed or partially completed, caused by the Contractor's correction or removal of the nonconforming work.

12.2.5 WARRANTY CORRECTIONS (INCLUDES REPLACEMENT)

Pursuant to the warranty in Sections 3.5 and 9.7.1, if within one (1) year after the Completion of the Work or within a longer time period for an applicable special warranty or guarantee required by the Contract Documents, any of the Work does not comply with the Contract Documents, the Contractor shall correct it after receipt of Owner's written notice to do so, unless the Owner has previously waived in writing such right to demand correction. Contractor shall correct the Work promptly, and passage of the applicable warranty period shall not release Contractor from its obligation to correct the Work if Owner provided the written notice within the applicable warranty period. Contractor's obligation to correct the warranty item continues until the correction is made. After the correction is made to Owner's satisfaction, a new warranty period of the same length as the original warranty period shall run on the corrected work. The obligations under this paragraph 12.2.5 shall survive acceptance of the Work under the Contract and termination of the Contract.

12.2.6 NO TIME LIMITATION

Nothing contained in this Section 12.2 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 one (1) year as described in Sections 3.5, 9.7.1, and 12.2.5 relates only to the specific warranty obligation of the Contractor to correct the Work after the date of commencement of warranties, and has, for example, no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, or 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.

12.3 NONCONFORMING WORK AND WITHHOLDING THE VALUE OF IT

If it is found at any time before Completion of the Work that the Contractor has varied from the Contract Documents in materials, quality, form, finish, or in the amount or value of the materials or labor used, the Owner may, in addition to other remedies in the Contract Documents or under law and as allowed by law, accept the improper Work. The Owner may withhold from any amount due or to become due Contractor that sum of money equivalent to the difference in value between the Work performed and that called for by the Drawings and Specifications. The Owner shall determine such difference in value. No structural-related Work shall be accepted that is not in conformance with the Contract Documents.

ARTICLE 13

MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located.

13.2 SUCCESSORS AND ASSIGNS

The Owner and the Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to the other party hereto and to partners, successors, assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole or in part without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

13.3 WRITTEN NOTICE

In the absence of specific notice requirements in the Contract Documents, written notice shall be deemed to have been duly served if delivered in person to the individual, member of the firm or entity, or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified or overnight mail to the last business address known to the party giving notice. Owner shall, at Contractor's cost, timely notify Contractor of Owner's receipt of any third party claims relating to the Contract pursuant to Public Contract Code section 9201.

13.4 RIGHTS AND REMEDIES

13.4.1 DUTIES AND OBLIGATIONS CUMULATIVE

Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

13.4.2 NO WAIVER

No action or failure to act by the Owner, Inspector of Record, Architect or any construction manager shall constitute a waiver of a right or duty afforded them under the Contract Documents, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed to in a written amendment to the Contract.

13.5 TESTS AND INSPECTIONS

13.5.1 COMPLIANCE

Tests, inspections, and approvals of portions of the Work required by the Contract Documents will comply with Title 24, and with all other laws, ordinances, rules, regulations, or orders of public authorities having jurisdiction.

13.5.2 INDEPENDENT TESTING LABORATORY

The Owner will select and pay an independent testing laboratory to conduct all tests and

inspections, including shipping or transportation costs or expenses (mileage and hours). Selection of the materials required to be tested shall be made by the laboratory or the Owner's representative and not by the Contractor. However, if Contractor requests that the Owner use a different testing laboratory and Owner chooses to approve such request, Contractor shall pay any additional shipping or transportation costs or expenses (mileage and hours). If Owner pays such additional costs or expenses instead of Contractor, then Owner may invoice such costs or expenses to the Contractor or withhold such costs or expenses from progress payments and/or retention.

13.5.3 ADVANCE NOTICE TO INSPECTOR OF RECORD

The Contractor shall notify the Inspector of Record a sufficient time in advance of its readiness for required observation or inspection so that the Inspector of Record may arrange for same. The Contractor shall notify the Inspector of Record a sufficient time in advance of the manufacture of material to be supplied under the Contract Documents which must, by terms of the Contract Documents, be tested in order that the Inspector of Record may arrange for the testing of the material at the source of supply.

13.5.4 TESTING OFF-SITE

Any material shipped by the Contractor from the source of supply, prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said Inspector of Record that such testing and inspection will not be required, shall not be incorporated in the Work.

13.5.5 ADDITIONAL TESTING OR INSPECTION

If the Inspector of Record, the Architect, the Owner, or public authority having jurisdiction determines that portions of the Work require additional testing, inspection, or approval not included under section 13.5.1, the Inspector of Record will, upon written authorization from the Owner, make arrangements for such additional testing, inspection, or approval. The Owner shall bear such costs except as provided in section 13.5.6.

13.5.6 COSTS FOR RETESTING

If such procedures for testing, inspection, or approval under sections 13.5.1, 13.5.2 and 13.5.5 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, the Contractor shall bear all costs arising from such failure, including those of re-testing, re-inspection, or re-approval, including, but not limited to, compensation for the Architect's services and expenses. Any such costs shall be paid by the Owner, invoiced to the Contractor, and, among other remedies, can be withheld from progress payments and/or retention.

13.5.7 COSTS FOR PREMATURE TEST

In the event the Contractor requests any test or inspection for the Project and is not completely ready for the inspection, the Contractor shall be invoiced by the Owner for all costs and expenses

resulting from that testing or inspection, including, but not limited to, the Architect's fees and expenses, and the amount of the invoice can among other remedies, be withheld from progress payments and/or retention.

13.5.8 TESTS OR INSPECTIONS NOT TO DELAY WORK

Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

13.6 [INTENTIONALLY LEFT BLANK]

13.7 TRENCH EXCAVATION

13.7.1 TRENCHES GREATER THAN FIVE FEET

Pursuant to Labor Code section 6705, if the Contract Sum exceeds $25,000 and involves the excavation of any trench or trenches five (5) feet or more in depth, the Contractor shall, in advance of excavation, submit to the Owner or a registered civil or structural engineer employed by the Owner a detailed plan showing the design of shoring for protection from the hazard of caving ground during the excavation of such trench or trenches.

13.7.2 EXCAVATION SAFETY

If such plan varies from the Shoring System Standards established by the Construction Safety Orders, the plan shall be prepared by a registered civil or structural engineer, but in no case shall such plan be less effective than that required by the Construction Safety Orders. No excavation of such trench or trenches shall be commenced until said plan has been accepted by the Owner or by the person to whom authority to accept has been delegated by the Owner.

13.7.3 NO TORT LIABILITY OF OWNER

Pursuant to Labor Code section 6705, nothing in this Article shall impose tort liability upon the Owner or any of its employees.

13.7.4 NO EXCAVATION WITHOUT PERMITS

The Contractor shall not commence any excavation work until it has secured all necessary permits including the required CAL OSHA excavation/shoring permit. Any permits shall be prominently displayed on the Site prior to the commencement of any excavation.

13.8 WAGE RATES

13.8.1 WAGE RATES

Pursuant to the provisions of Article 2 (commencing at § 1770), Chapter 1, Part 7, Division 2, of the Labor Code, the governing board of the Owner has obtained the general prevailing rate of per

diem wages and the general prevailing rate for holiday and overtime work in the locality in which this public work is to be performed for each craft, classification, or type of worker needed for this Project from the Director of Industrial Relations ("Director"). These rates are on file with the Clerk of the Owner's Governing Board, and copies will be made available to any interested party on request. The Contractor shall post a copy of such wage rates at the Site.

13.8.2 HOLIDAY AND OVERTIME PAY

Holiday and overtime work, when permitted by law, shall be paid for at a rate of at least one and one-half (1½) times the above specified rate of per diem wages, unless otherwise specified. Holidays shall be defined in the Collective Bargaining Agreement applicable to each particular craft, classification, or type of worker employed.

13.8.3 WAGE RATES NOT AFFECTED BY SUBCONTRACTS

The Contractor shall pay and shall cause to be paid each worker engaged in the Work not less than the general prevailing rate of per diem wages determined by the Director, regardless of any contractual relationship which may be alleged to exist between the Contractor or any Subcontractor and such workers.

13.8.4 CHANGE IN PREVAILING WAGE DURING BID OR CONSTRUCTION

If during the period this bid is required to remain open, the Director of Industrial Relations determines that there has been a change in any prevailing rate of per diem wages in the locality in which this public work is to be performed, such change shall not alter the wage rates discussed in the Notice to Bidders or the Contract subsequently awarded.

13.8.5 FORFEITURE AND PAYMENTS

Pursuant to Labor Code section 1775, the Contractor and any subcontractor under the Contractor shall as a penalty to the Owner, forfeit not more than two hundred dollars ($200.00) for each calendar day, or portion thereof, for each worker paid less than the prevailing rate of per diem wages, determined by the Director, for such craft or classification in which such worker is employed for any public work done under the Agreement by the Contractor or by any Subcontractor under it. Minimum penalties shall apply, as also provided in Civil Code section 1775. The amount of the penalty shall be determined by the Labor Commissioner and shall be based on both of the following: (1) whether the failure of the contractor or subcontractor to pay the correct rate of per diem wages was a good faith mistake and, if so, the error was promptly and voluntarily corrected upon being brought to the attention of the contractor or subcontractor; and (2) whether the contractor or subcontractor has a prior record of failing to meet its prevailing wage obligations. The difference between such prevailing rate of per diem wage and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing rate of per diem wage shall be paid to each work by the Contractor or subcontractor.

13.8.6 **MINIMUM WAGE RATES**

Any worker employed to perform Work, which Work is not covered by any craft or classification listed in the general prevailing rate of per diem wages determined by the Director, shall be paid not less than the minimum rate of wages specified therein for the craft or classification which most nearly corresponds to the Work to be performed by them, and such minimum wage rate shall be retroactive to time of initial employment of such person in such craft or classification.

13.8.7 **PER DIEM WAGES**

Pursuant to Labor Code section 1773.1, per diem wages includes employer payments for health and welfare, pension, and vacation pay.

13.8.8 **POSTING OF WAGE RATES AND OTHER REQUIRED JOB SITE NOTICES**

The Contractor shall post at appropriate conspicuous points on the Site, a schedule showing all determined minimum wage rates and all authorized deductions, if any, from unpaid wages actually earned and all other required job site notices as prescribed by regulation.

13.9 **RECORD OF WAGES PAID: INSPECTION**

13.9.1 **APPLICATION OF LABOR CODE**

Pursuant to section 1776 of the Labor Code:

(a) Each Contractor and subcontractor shall keep accurate payroll records, showing the name, address, social security number, work classification, and straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work. Each payroll record shall contain or be verified by a written declaration that is made under penalty of perjury, stating both of the following:

(1) The information contained in the payroll record is true and correct.

(2) The employer has complied with the requirements of sections 1771, 1811 and 1815 for any work performed by his or her employees on the public works project.

(b) The payroll records enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:

(1) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.

(2) A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the Owner and the Division of Labor Standards Enforcement of the Department of Industrial Relations ("DIR") and as may be required by the Labor Commissioner under Labor Code section 1771.4. The Contractor and each subcontractor shall furnish a certified copy of all payroll records directly to the Labor Commissioner monthly or more frequently, if so specified in the Agreement and in a format the Labor Commissioner prescribes.

(3) A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through either the body awarding the contract or the Division of Labor Standards Enforcement of the DIR. If the requested payroll records have not been provided pursuant to paragraph (2), the requesting party shall, prior to being provided the records, reimburse the costs of the preparation by the contractor, subcontractors, and the entity through which the request was made. The public may not be given access to such records at the principal office of the Contractor.

(c) Unless required as of January 1, 2015, to be furnished directly to the Labor Commissioner under Labor Code section 1771.4(a)(3), the certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement of the DIR or shall contain the same information as the forms provided by the division. The payroll records may consist of printouts of payroll data that are maintained as computer records, if the printouts contain the same information as the forms provided by the division and the printouts are verified in the manner specified in (a) above.

(d) A Contractor or subcontractor shall file a certified copy of the records enumerated in subdivision (a) with the entity that requested such records within 10 days after receipt of a written request.

(e) Except as provided in subdivision (f), any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body or the Division of Labor Standards Enforcement of the DIR shall be marked or obliterated to prevent disclosure of an individual's name, address and social security number. The name and address of the Contractor awarded the Contract or the subcontractor performing the Contract shall not be marked or obliterated. Any copy of records made available for inspection by, or furnished to, a multiemployer Taft-Hartley trust fund (29 U.S.C. Sec. 186(c)(5) that requests the records for the purposes of allocating contributions to participants shall be marked or obliterated only to prevent disclosure of an individual's full social security number, but shall provide the last four digits of the social security number. Any copy of records made available for inspection by, or furnished to, a joint labor-management committee established pursuant to the federal Labor Management Cooperation Act of 1978 (29 U.S.C. Sec. 175a) shall be marked or obliterated only to prevent disclosure of an individual's social security number.

(f) Notwithstanding any other provision of law, agencies that are included in the Joint Enforcement Strike Force on the Underground Economy established pursuant to Section 329 of the Unemployment Insurance Code and other law enforcement agencies investigating violations of law shall, upon request, be provided nonredacted copies of certified payroll records. Any copies of records or certified payroll made available for inspection and furnished upon request to the public by an agency included in the Joint Enforcement Strike Force on the Underground Economy or to a law enforcement agency investigating a violation of law shall be marked or redacted to prevent disclosure of an individual's name, address, and social security number. An employer shall not be liable for damages in a civil action for any reasonable act or omission taken in good faith in compliance with this subsection.

(g) The contractor shall inform the body awarding the contract of the location of the records enumerated under subdivision (a), including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

(h) The contractor or subcontractor has 10 days in which to comply subsequent to receipt of written notice requesting the records enumerated in subdivision (a). In the event that the Contractor or subcontractor fails to comply within the 10-day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit one hundred dollars ($100.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Labor Standards Enforcement of the DIR, these penalties shall be withheld from progress payments then due. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of the subcontractor to comply with this section.

13.10 APPRENTICES

13.10.1 APPRENTICE WAGES AND DEFINITIONS

All apprentices employed by the Contractor to perform services under the Contract shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he or she is employed, and shall be employed only at the work of the craft or trade to which he or she is registered. Only apprentices, as defined in section 3077 of the Labor Code, who are in training under apprenticeship standards and written apprenticeship agreements under Chapter 4 (commencing with § 3070) of Division 3, are eligible to be employed under this Contract. The employment and training of each apprentice shall be in accordance with the apprenticeship standards and apprentice agreements under which he or she is training.

13.10.2 APPRENTICE LABOR POOL

When the Contractor to whom the Contract is awarded by the Owner, or any Subcontractor under him or her, in performing any of the Work under the Contract or subcontract, employs workers in any apprenticeable craft or trade, the Contractor and Subcontractor shall apply to the joint

apprenticeship committee administering the apprenticeship standards of the craft or trade in the area of the Site of the Project, for a certificate approving the Contractor or Subcontractor under the apprenticeship standards for the employment and training of apprentices in the area or industry affected. However, approval as established by the joint apprenticeship committee or committees shall be subject to the approval of the Administrator of Apprenticeship. The joint apprenticeship committee or committees, subsequent to approving the subject Contractor or Subcontractor, shall arrange for the dispatch of apprentices to the Contractor or Subcontractor in order to comply with this section. Every Contractor and Subcontractor shall submit the contract award information to the applicable joint apprenticeship committee which shall include an estimate of journeyman hours to be performed under the Contract, the number of apprentices to be employed, and the approximate dates the apprentices will be employed. There shall be an affirmative duty upon the joint apprenticeship committee or committees administering the apprenticeship standards of the crafts or trade in the area of the Site of the public work, to ensure equal employment and affirmative action and apprenticeship for women and minorities. Contractors or Subcontractors shall not be required to submit individual applications for approval to local joint apprenticeship committees provided they are already covered by the local apprenticeship standards. The ratio of work performed by apprentices to journeymen, who shall be employed in the craft or trade on the Project, may be the ratio stipulated in the apprenticeship standards under which the joint apprenticeship committee operates, but, except as otherwise provided in this section, in no case shall the ratio be less than one (1) hour of apprentice work for every five (5) hours of labor performed by a journeyman. However, the minimum ratio for the land surveyor classification shall not be less than one (1) apprentice for each five (5) journeymen.

13.10.3 JOURNEYMAN/APPRENTICE RATIO; COMPUTATION OF HOURS

Any ratio shall apply during any day or portion of a day when any journeyman, or the higher standard stipulated by the joint apprenticeship committee, is employed at the job Site and shall be computed on the basis of the hours worked during the day by journeymen so employed, except for the land surveyor classification. The Contractor shall employ apprentices for the number of hours computed as above before the end of the Contract. However, the Contractor shall endeavor, to the greatest extent possible, to employ apprentices during the same time period that the journeymen in the same craft or trade are employed at the job Site. Where an hourly apprenticeship ratio is not feasible for a particular craft or trade, the Division of Apprenticeship Standards, upon application of a joint apprenticeship committee, may order a minimum ratio of not less than one (1) apprentice for each five (5) journeymen in a craft or trade classification.

13.10.4 JOURNEYMAN/APPRENTICE RATIO

The Contractor or Subcontractor, if he or she is covered by this section upon the issuance of the approval certificate, or if he or she has been previously approved in the craft or trade, shall employ the number of apprentices or the ratio of apprentices to journeymen stipulated in the apprenticeship standards. Upon proper showing by the Contractor that he or she employs apprentices in the craft or trade in the state on all of his or her contracts on an annual average of not less than one (1) hour of apprentice work for every five (5) hours of labor performed by a journeyman, or in the land surveyor classification, one (1) apprentice for each five (5)

journeymen, the Division of Apprenticeship Standards may grant a certificate exempting the Contractor from the 1-to-5 hourly ratio as set forth in this section. This section shall not apply to contracts of general contractors or to contracts of specialty contractors not bidding for work through a general or prime contractor, when the contracts of general contractors or those specialty contractors involve less than Thirty Thousand Dollars ($30,000) or twenty (20) working days. Any work performed by a journeyman in excess of eight (8) hours per day or forty (40) hours per week, shall not be used to calculate the hourly ratio required by this section.

13.10.4.1 ***Apprenticeable Craft or Trade.*** "Apprenticeable craft or trade" as used in this Article means a craft or trade determined as an apprenticeable occupation in accordance with the rules and regulations prescribed by the California Apprenticeship Council. The joint apprenticeship committee shall have the discretion to grant a certificate, which shall be subject to the approval of the Administrator of Apprenticeship, exempting a Contractor from the 1-to-5 ratio set forth in this Article when it finds that any one of the following conditions is met:

A. Unemployment for the previous three-month period in the area exceeds an average of fifteen percent (15%).

B. The number of apprentices in training in such area exceeds a ratio of 1-to-5.

C. There is a showing that the apprenticeable craft or trade is replacing at least one-thirtieth (1/30) of its journeymen annually through the apprenticeship training, either on a statewide basis or on a local basis.

D. Assignment of an apprentice to any work performed under this contract would create a condition which would jeopardize his or her life or the life, safety, or property of fellow employees or the public at large or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyman.

13.10.5 **RATIO EXEMPTION**

When exemptions are granted to an organization which represents Contractors in a specific trade from the 1-to-5 ratio on a local or statewide basis, the member Contractors will not be required to submit individual applications for approval to local joint apprenticeship committees, if they are already covered by the local apprenticeship standards.

13.10.6 **APPRENTICE FUND**

A Contractor to whom the Contract is awarded or any Subcontractor under him or her, who, in performing any of the work under the Contract, employs journeymen or apprentices in any apprenticeable craft or trade and who is not contributing to a fund or funds to administer and conduct the apprenticeship program in any such craft or trade in the area of the Site of the Project, to which fund or funds other contractors in the area of the Site of the Project are contributing, shall contribute to the fund or funds in each craft or trade in which he or she employs journeymen or apprentices on the Project in the same amount or upon the same basis

and in the same manner as the other contractors do, but where the trust fund administrators are unable to accept the funds, contractors not signatory to the trust agreement shall pay a like amount to the California Apprenticeship Council. The Contractor or Subcontractor may add the amount of the contributions in computing his or her bid for the contract. The Division of Labor Standards Enforcement is authorized to enforce the payment of the contributions to the fund or funds as set forth in the Labor Code section 227.

13.10.7 PRIME CONTRACTOR COMPLIANCE

The responsibility of compliance with section 13.10 and section 1777.5 of the Labor Code for all apprenticeable occupations is with the Contractor.

13.10.8 DECISIONS OF JOINT APPRENTICESHIP COMMITTEE

All decisions of the joint apprenticeship committee under this section13.10 and Labor Code section 1777.5 are subject to Labor Code section 3081.

13.10.9 NO BIAS

It shall be unlawful for an employer or a labor union to refuse to accept otherwise qualified employees as registered apprentices on any public works on the grounds of race, religious creed, color, national origin, ancestry, sex, or age, except as provided in the Labor Code section 3077.

13.10.10 VIOLATION OF LABOR CODE

Pursuant to Labor Code sections 1777.1 and 1777.7, in the event a Contractor or Subcontractor fails to comply with the provisions of this section 13.10 and Labor Code section 1777.5, penalties shall apply, including among other things:

(a) The Labor Commissioner may deny to the contractor or subcontractor, and to its responsible officers, the right to bid on, or be awarded or perform work as a subcontractor on, any public works project for a period of up to one year for the first violation and for a period of up to three years for the second and subsequent violation. Each period of debarment shall run from the date the determination of noncompliance by the Labor Commissioner becomes a final order.

(b) A contractor or subcontractor who violates section 1777.5 shall forfeit as a civil penalty an amount not exceeding the sum of one hundred dollars ($100) for each full calendar day of noncompliance. Upon receipt of a determination that a civil penalty has been imposed, the awarding body shall enforce the penalty, which includes withholding the amount of the civil penalty from the contract progress payments or retention then due or to become due.

(c) In lieu of the penalty provided, the Labor Commissioner may for a first time violation and with the concurrence of an applicable apprenticeship program, order the contractor or subcontractor to provide apprentice employment equivalent to the work

hours that would have been provided for apprentices during the period of noncompliance.

(d) Any funds withheld by the awarding body pursuant to this section shall be deposited in the General Fund.

(e) The interpretation and enforcement of section 1777.5 and this section shall be in accordance with the regulations of the California Apprenticeship Council.

Pursuant to Public Contract Code section 6109, no contractor or subcontractor may bid on, be awarded, or perform work as a subcontractor on a public works project if ineligible to bid or work on, or be awarded, a public works project pursuant to section 1777.1 of the Labor Code.

13.11 ASSIGNMENT OF ANTITRUST CLAIMS

13.11.1 APPLICATION

Pursuant to Public Contract Code section 7103.5 and Government Code section 4552, in entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or Subcontractor offers and agrees to assign to the Owner all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act, (15 U.S.C. § 15) or under the Cartwright Act (Chapter 2 [commencing with § 16700] of Part 2 of Division 7 of the Bus. & Prof. Code), arising from the purchase of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders Final Progress Payment to the Contractor, without further acknowledgment by the parties. If the Owner receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under Chapter 11 (commencing with § 4550) of Division 5 of Title 1 of the Government Code, the assignor may, upon demand, recover from the Owner any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the Owner as part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

13.11.2 ASSIGNMENT OF CLAIM

Upon demand in writing by the assignor, the Owner shall, within one (1) year from such demand, reassign the cause of action assigned pursuant to this Article if the assignor has been or may have been injured by the violation of law for which the cause of action arose and the Owner has not been injured thereby or the Owner declines to file a court action for the cause of action.

13.12 AUDIT

Pursuant to and in accordance with the provisions of Government Code section 8546.7, or any amendments thereto, all books, records, and files of the Owner, the Contractor, or any Subcontractor connected with the performance of this Contract involving the expenditure of state funds in excess of Ten Thousand Dollars ($10,000.00), including, but not limited to, the

administration thereof, shall be subject to the examination and audit of the Office of the Auditor General of the State of California for a period of three (3) years after release of all retention under this Contract. Contractor shall preserve and cause to be preserved such books, records, and files for the audit period. During the progress of the Work and for three (3) years after release of all retention under the Contract, Owner shall also have the right to an audit, and Contractor must cooperate by producing all information requested within seven (7) days.

13.13 STORM WATER DISCHARGE PERMIT

If applicable, the Contractor shall file a Notice of Intent to comply with the terms of the general permit to discharge storm water associated with construction activity (WQ Order No. 920-08-DWQ). The Notice of Intent must be sent to the following address along with the appropriate payment (warrant to be furnished by the Owner upon request by the Contractor, allow warrant processing time.): California State Water Resources Control Board, Division of Water Quality, Storm Water Permit Unit, P.O. Box 1977, Sacramento, CA 95812-1977. The Contractor may also call the State Water Board's Construction Activity Storm Water Hotline at (916) 657-1146. The Notice of Intent shall be filed prior to the start of any construction activity.

ARTICLE 14

TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR FOR CAUSE

Contractor may not terminate for convenience. Contractor may only terminate for cause if the Work is stopped by others for a period of one hundred eighty (180) consecutive days through no act or fault of the Contractor, a Subcontractor of any tier, their agents or employees, or any other persons performing portions of the Work for whom the Contractor is contractually responsible, **and** the Work was stopped by others for one of the following reasons: (A) Issuance of an order of a court or other public authority having jurisdiction which requires Owner to stop all Work; or (B) an act of government, such as a declaration of national emergency, making material unavailable which requires Owner to stop all Work. If such grounds exist, the Contractor may serve written notice of such grounds on Owner and demand a meet-and-confer conference to negotiate a resolution in good faith within twenty (20) days of Owner's receipt of such notice. If such conference does not lead to resolution and the grounds for termination still exist, Contractor may terminate the Contract and recover from the Owner payment for Work executed and for reasonable verified costs with respect to materials, equipment, tools, construction equipment, and machinery, including reasonable overhead, profit, and damages for the Work executed, but excluding overhead (field and home office) and profit for (i) Work not performed and (ii) the period of time that the Work was stopped.

14.2 TERMINATION BY THE OWNER FOR CAUSE

14.2.1 GROUNDS FOR TERMINATION

The Owner may terminate the Contract if the Contractor:

A. Refuses or fails to supply enough properly skilled workers or proper materials, or refuses or fails to take steps to adequately prosecute the Work to meet a Milestone Deadline or to Complete within the Contract Time;

B. Fails to make payment to Subcontractors for materials or labor in accordance with Public Contract Code section 10262 or Business and Professions Code section 7108.5, as applicable;

C. Violates Labor Code section 1771.1(a), subject to the provisions of Labor Code section 1771.1(f);

D. Disregards laws, ordinances, rules, regulations, or orders of a public authority having jurisdiction; or

E. Otherwise is in breach of the Contract Documents.

14.2.2 NOTIFICATION OF TERMINATION

When any of the above reasons exist, the Owner may, without prejudice to any other rights or remedies of the Owner, give notice to Contractor of the grounds for termination and demand cure of the grounds within seven (7) days (a "Notice of Intent to Terminate"). If Contractor fails to **either** (a) completely cure the grounds for termination within seven (7) days **or** (b) reasonably commence cure of the grounds for termination within seven (7) days and reasonably continue to cure the grounds for termination until such cure is complete, then Owner may terminate the Contract effective immediately upon service of written Notice of Termination and may, subject to any prior rights of Contractor's surety on the performance bond ("Surety"):

A. Take possession of the Site and of all material, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

B. Accept assignment of subcontracts pursuant to section 5.4; and

C. Complete the Work by whatever reasonable method the Owner may deem expedient.

14.2.3 PAYMENTS WITHHELD

If the Owner terminates the Contract for one of the reasons stated in section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is Complete.

14.2.4 **PAYMENTS UPON COMPLETION**

If the unpaid balance of the Contract Sum exceeds costs of Completing the Work, including compensation for professional services and expenses made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. This payment obligation shall survive Completion of the Work.

14.2.5 **INCLUSION OF TERMINATION FOR CONVENIENCE**

Any purported termination by Owner for cause under this section 14.2, which is revoked or determined to not have been for cause, shall be deemed to have been a termination for convenience effective as of the same date as the purported termination for cause.

14.3 SUSPENSION OR TERMINATION BY THE OWNER FOR CONVENIENCE

14.3.1 **SUSPENSION BY OWNER**

The Owner may, without cause, order the Contractor in writing to suspend, delay, or interrupt the Work in whole or in part for such period of time as the Owner may determine.

14.3.1.1 ***Adjustments.*** An adjustment shall be made for increases in the cost of performance of the Contract, including profit on the increased cost of performance caused by suspension, delay, or interruption. No adjustment shall be made to the extent:

A. That performance is, was or would have been so suspended, delayed, or interrupted by another cause for which the Contractor is responsible; or

B. That an equitable adjustment is made or denied under another provision of this Contract.

14.3.1.2 ***Adjustments for Fixed Cost.*** Adjustments made in the cost of performance may have a mutually agreed fixed or percentage fee.

14.3.2 **TERMINATION BY THE OWNER FOR CONVENIENCE**

14.3.2.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

14.3.2.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

1. Cease operations as directed by the Owner in the notice;

2. Take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

3. Except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

14.3.2.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination.

14.4 NOT A WAIVER

Any suspension or termination by Owner for convenience or cause under this Article 14 shall not act as a waiver of any claims by Owner against Contractor or others for damages based on breach of contract, negligence or other grounds.

14.5 MUTUAL TERMINATION FOR CONVENIENCE

The Contractor and the Owner may mutually agree in writing to terminate this Contract for convenience. The Contractor shall receive payment for all Work performed to the date of termination in accordance with the provisions of Article 9.

14.6 EARLY TERMINATION

Notwithstanding any provision herein to the contrary, if for any fiscal year of this Contract the governing body of the Owner fails to appropriate or allocate funds for future periodic payments under the Contract after exercising reasonable efforts to do so, the Owner may upon thirty (30) days' notice, order Work on the Project to cease. The Owner will remain obligated to pay for the Work already performed but shall not be obligated to pay the balance remaining unpaid beyond the fiscal period for which funds have been appropriated or allocated and for which the Work has not been done.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS that we, _____ _____ as Principal and _____ as Surety, are held and firmly bound unto **Merced City School District**, in the County of Merced, State of California, hereinafter called the "Owner", in the sum of _____ Dollars ($_____) for the payment of which sum well and truly made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, to the Owner for the full performance of a certain contract with the Owner, the terms of which are incorporated herein by reference, dated _____, 2025, for construction of:

TENAYA MIDDLE SCHOOL SPORTS FIELD RENOVATION
Bid # 2025-4

The condition of this obligation is such that**,** if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term of said Contract and any extensions thereof that may be granted by the Owner, with or without notice to the Surety, and for the period of time specified in the Contract after completion for correction of faulty or improper materials and workmanship and during the life of any guaranty or warranty required under the Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreement of any and all duly authorized modifications of said Contract that may hereafter be made, then this obligation is to be void, otherwise to remain in full force and virtue.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder or the specifications accompanying the same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, or to the Work, or to the specifications.

No further agreement between Surety and Owner shall be required as a prerequisite to the Surety performing its obligations under this bond.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals this _____ day of _____, _____ hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(To be signed by)
(Principal and Surety,)
(and acknowledged and)
(Notarial Seal attached)

(Affix Corporate Seal)

_____
(Individual Principal)

_____
(Business Address)

(Affix Corporate Seal)

_____
(Corporate Principal)

_____
(Business Address)

(Affix Corporate Seal)

_____
(Corporate Surety)

_____
(Business Address)

_____

By:_____

_____

The rate of premium on this bond is _____ per thousand.

The total amount of premium charged is _____.

The above must be filled in by Corporate Surety.

PAYMENT BOND
(Labor and Material)

KNOW ALL MEN BY THESE PRESENTS:

That WHEREAS, Merced City School District (the "Owner" of the public works project described below) and _____,
hereinafter designated as the "Principal," have entered into a Contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to construct:

TENAYA MIDDLE SCHOOL SPORTS FIELD RENOVATION
Bid # 2025-4

Which said agreement dated _____, 2026, and all of the Contract Documents are hereby referred to and made a part hereof;

and

WHEREAS, the Principal is required, before entering upon the performance of the work, to file a good and sufficient bond with the body by whom the Contract is awarded to secure the claims arising under said agreement.

NOW, THEREFORE, THESE PRESENTS WITNESSETH:

That the said Principal and the undersigned _____
("Surety") are held and firmly bound unto all laborers, material men, and other persons, and bound for all amounts due, referred to in Civil Code section 9554, subdivision (b), in the sum of _____ Dollars ($_____)
which sum well and truly be made, we bind ourselves, our heirs, executors, administrators, successors, or assigns, jointly and severally, by these presents.

The condition of this obligation is that if the said Principal or any of its subcontractors, or the heirs, executors, administrators, successors, or assigns of any, all, or either of them, shall fail to pay any of the persons named in Civil Code section 9100, or any of the amounts due, as specified in Civil Code section 9554, subdivision (b), that said Surety will pay the same in an amount not exceeding the amount hereinabove set forth, and also in case suit is brought upon this bond, will pay costs and reasonable attorney's fees to be awarded and fixed by the Court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims so as to give a right of action to them or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect.

And the said Surety, for value received, thereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of said contract or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration, or addition.

IN WITNESS WHEREOF, this instrument has been duly executed by the Principal and Surety this _____ day of _____, _____.

(To be signed by)
(Principal and Surety,)
(and acknowledged and)
(Notarial Seal attached)

_____
Principal

_____

_____
Surety

_____

By:_____
Attorney-in-Fact

_____

The above bond is accepted and approved this ____ day of _____.

AGREEMENT BETWEEN OWNER AND CONTRACTOR

This Agreement, effective 2026, by and between the Merced City School District**,** Merced County, California, hereinafter called the "Owner," and **Contractor**., hereinafter called the "Contractor."

WITNESSETH: That the Contractor and the Owner for the consideration hereinafter named agree as follows:

ARTICLE I. SCOPE OF WORK. The Contractor agrees to furnish all labor, equipment and materials, including tools, implements, and appliances required, and to perform all the work in a good and workmanlike manner, free from any and all liens and claims from mechanics, material suppliers, subcontractors, artisans, machinists, teamsters, freight carriers, and laborers required for:

Tenaya Middle School Sports Field Renovation
Bid # 2025-4

all in strict compliance with the plans, drawings and specifications therefore prepared by:

TANAKA DESIGN GROUP
Attn:
Bob Tanaka
bob@tanakadesign.com
3755 Balboa Street, Suite 204
San Francisco, CA 94121
415-845-7340

and other contract documents relating thereto.

ARTICLE II. CONTRACT DOCUMENTS. The Contractor and the Owner agree that all of the documents listed in Article 1.1.1 of the General Conditions form the Contract Documents which form the Contract.

ARTICLE III. TIME TO COMPLETE AND LIQUIDATED DAMAGES.

Time is of the essence in this contract, and the time of completion for the Project shall be **Three Hundred Sixty (360)** calendar days, including the plant establishment period from (a) the date of commencement of the Work as established in the Owner's Notice to Proceed, or (b) if no other date is established in a Notice to Proceed from Owner, the date of Contractor's actual commencement of the Work (including mobilization).

Failure to complete the Project within the time and in the manner provided for by the Contract Documents shall subject the Contractor to liquidated damages. For purposes

of liquidated damages, the concept of substantial completion shall not constitute completion and is not part of the Contract Documents. The actual occurrence of damages and the actual amount of the damages which the Owner would suffer if the Project were not completed within the specified times set forth are dependent upon many circumstances and conditions which could prevail in various combinations and, from the nature of the case, it is impracticable and extremely difficult to fix the actual damages. Damages which the Owner would suffer in the event of delay include, but are not limited to, loss of the use of the Project, disruption of activities, costs of administration, supervision and the incalculable inconvenience and loss suffered by the public.

Accordingly, the parties agree that the amount herein set forth shall be the amount of damages which the Owner shall directly incur upon failure of the Contractor to complete the Project within the time specified: (**$1,000.00) for each calendar day** by which completion of the Project is delayed beyond the completion date as adjusted by change orders.

If the Contractor becomes liable under this section, the Owner, in addition to all other remedies provided by law, shall have the right to withhold any and all retained percentages of payments and/or progress payments, and to collect the interest thereon, which would otherwise be or become due the Contractor until the liability of the Contractor under this section has been finally determined. If the retained percentages and withheld progress payments appear insufficient to discharge all liabilities of the Contractor incurred under this Article, the Contractor and its sureties shall continue to remain liable to the Owner for such liabilities until all such liabilities are satisfied in full.

If the Owner accepts any work or makes any payment under this Agreement after a default by reason of delays, the payment or payments shall in no respect constitute a waiver or modification of any Agreement provisions regarding time of completion and liquidated damages.

ARTICLE IV. PAYMENT AND RETENTION. The Owner agrees to pay the Contractor in current funds **amount ($)** for work satisfactorily performed after receipt of properly documented and submitted Applications for Payment and to make payments on account thereof, as provided in the General Conditions.

ARTICLE V. CHANGES. Changes in this Agreement or in the Work to be done under this Agreement shall be made as provided in the General Conditions.

ARTICLE VI. TERMINATION. The Owner or Contractor may terminate the Contract as provided in the General Conditions.

ARTICLE VII. PREVAILING WAGES. The Project is a public work, the Work shall be performed as a public work and pursuant to the provisions of Section 1770 et seq. of the Labor Code of the State of California, which are hereby incorporated by reference and made a part hereof, the Director of Industrial Relations has determined the general prevailing rate of per diem wages and the general prevailing rate for holiday and

overtime work in the locality in which the work is to be performed, for each craft, classification or type of worker needed to execute this Contract. Per diem wages shall be deemed to include employer payments for health and welfare, pension, vacation, apprenticeship or other training programs, and similar purposes. Copies of the rates are on file at the Owner's principal office. The rate of prevailing wage for any craft, classification or type of workmanship to be employed on this Project is the rate established by the applicable collective bargaining agreement which rate so provided is hereby adopted by reference and shall be effective for the life of this Agreement or until the Director of the Department of Industrial Relations determines that another rate be adopted. It shall be mandatory upon the Contractor and on any subcontractor to pay not less than the said specified rates to all workers employed in the execution of this Agreement.

The Contractor and any subcontractor under the Contractor as a penalty to the Owner shall forfeit not more than Two Hundred Dollars ($200.00) for each calendar day or portion thereof for each worker paid less than the stipulated prevailing rates for such work or craft in which such worker is employed. The difference between such stipulated prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor.

The Contractor and each Subcontractor shall keep or cause to be kept an accurate record for work on this Project showing the names, addresses, social security numbers, work classification, straight time and overtime hours worked and occupations of all laborers, workers and mechanics employed by them in connection with the performance of this Contract or any subcontract thereunder, and showing also the actual per diem wage paid to each of such workers, which records shall be open at all reasonable hours to inspection by the Owner, its officers and agents and to the representatives of the Division of Labor Law Enforcement of the State Department of Industrial Relations. The Contractor and each subcontractor shall furnish a certified copy of all payroll records directly to the Labor Commissioner.

For public works contracts awarded on and after January 1, 2015, those public works projects shall be subject to compliance monitoring and enforcement by the Department of Industrial Relations.

As of March 1, 2015, a contractor or subcontractor shall not be qualified to submit a bid or to be listed in a bid proposal subject to the requirements of Public Contract Code section 4104 unless currently registered and qualified under Labor Code section 1725.5 to perform public work as defined by Division 2, Part 7, Chapter 1 (§§1720 et seq.) of the Labor Code.

As of April 1, 2015, a contractor or subcontractor shall not be qualified to enter into, or engage in the performance of, any contract of public work (as defined by Division 2, Part 7, Chapter 1 (§§1720 et seq.) of the Labor Code) unless currently registered and qualified under Labor Code section 1725.5 to perform public work.

ARTICLE VIII. WORKING HOURS. In accordance with the provisions of Sections 1810 to 1815, inclusive, of the Labor Code of the State of California, which are hereby incorporated and made a part hereof, the time of service of any worker employed by the Contractor or a Subcontractor doing or contracting to do any part of the Work contemplated by this Agreement is limited and restricted to eight hours during any one calendar day and forty hours during any one calendar week, provided, that work may be performed by such employee in excess of said eight hours per day or forty hours per week provided that compensation for all hours worked in excess of eight hours per day, and forty hours per week, is paid at a rate not less than one and one-half (1½) times the basic rate of pay. The Contractor and every Subcontractor shall keep an accurate record showing the name of and the actual hours worked each calendar day and each calendar week by each worker employed by them in connection with the Work. The records shall be kept open at all reasonable hours to inspection by representatives of the Owner and the Division of Labor Law Enforcement. The Contractor shall as a penalty to the Owner forfeit Twenty-five Dollars ($25.00) for each worker employed in the execution of this Agreement by the Contractor or by any subcontractor for each calendar day during which such worker is required or permitted to work more than eight hours in any one calendar day, and forty hours in any one calendar week, except as herein provided.

ARTICLE IX. APPRENTICES. The Contractor agrees to comply with Chapter 1, Part 7, Division 2, Sections 1777.5 and 1777.6 of the California Labor Code, which are hereby incorporated and made a part hereof. These sections require that contractors and subcontractors employ apprentices in apprenticeable occupations in a ratio of not less than one hour of apprentice's work for each five hours of work performed by a journeyman (unless an exemption is granted in accordance with Section 1777.5) and that contractors and subcontractors shall not discriminate among otherwise qualified employees as indentured apprentices on any public works solely on the ground of sex, race, religious creed, national origin, ancestry or color. Only apprentices as defined in Labor Code Section 3077, who are in training under apprenticeship standards and who have signed written apprentice agreements, will be employed on public works in apprenticeable occupations. The responsibility for compliance with these provisions is fixed with the Contractor for all apprenticeable occupations.

ARTICLE X. DSA OVERSIGHT PROCESS. The Contractor must comply with the applicable requirements of the Division of State Architect ("DSA") Construction Oversight Process ("DSA Oversight Process"), including but not limited to (a) notifying the Owner's Inspector of Record/Project Inspector ("IOR") upon commencement and completion of each aspect of the work as required under DSA Form 156; (b) coordinating the Work with the IOR's inspection duties and requirements; (c) submitting verified reports under DSA Form 6-C; and (d) coordinating with the Owner, Owner's Architect, any Construction Manager, any laboratories, and the IOR to meet the DSA Oversight Process requirements without delay or added costs to the Project.

Contractor shall be responsible for any additional DSA fees related to review of proposed changes to the DSA-approved construction documents, to the extent the

proposed changes were caused by Contractor's wrongful act or omissions. If inspected work is found to be in non-compliance with the DSA-approved construction documents or the DSA-approved testing and inspection program, then it must be removed and corrected. Any construction that covers unapproved or uninspected work is subject to removal and correction, at Contractor's expense, in order to permit inspection and approval of the covered work in accordance with the DSA Oversight Process.

ARTICLE XI. INDEMNIFICATION AND INSURANCE. The Contractor will defend, indemnify and hold harmless the Owner, its governing board, officers, agents, trustees, employees and others as provided in the General Conditions.

By this statement the Contractor represents that it has secured the payment of Workers' Compensation in compliance with the provisions of the Labor Code of the State of California and during the performance of the work contemplated herein will continue so to comply with said provisions of said Code. The Contractor shall supply the Owner with certificates of insurance evidencing that Workers' Compensation Insurance is in effect and providing that the Owner will receive thirty (30) days' notice of cancellation.

Contractor shall provide the insurance set forth in the General Conditions. The amount of general liability insurance shall be $1 million per occurrence for bodily injury, personal injury and property damage and the amount of automobile liability insurance shall be $1 million per accident for bodily injury and property damage combined single limit.

ARTICLE XII. ENTIRE AGREEMENT. The Contract constitutes the entire agreement between the parties relating to the Project, and supersedes any prior or contemporaneous agreement between the parties, oral or written, including the Owner's award of the Project to Contractor, unless such agreement is expressly incorporated herein. The Owner makes no representations or warranties, express or implied, not specified in the Contract. The Contract is intended as the complete and exclusive statement of the parties' agreement pursuant to Code of Civil Procedure section 1856.

ARTICLE XIII. EXECUTION OF OTHER DOCUMENTS. The parties to this Agreement shall cooperate fully in the execution of any and all other documents and in the completion of any additional actions that may be necessary or appropriate to give full force and effect to the terms and intent of the Contract.

ARTICLE XIV. EXECUTION IN COUNTERPARTS. This Agreement may be executed in counterparts such that the signatures may appear on separate signature pages. A copy, or an original, with all signatures appended together, shall be deemed a fully executed Agreement.

ARTICLE XV. BINDING EFFECT. Contractor, by execution of this Agreement, acknowledges that Contractor has read this Agreement and the other Contract Documents, understands them, and agrees to be bound by their terms and conditions.

The Contract shall inure to the benefit of and shall be binding upon the Contractor and the Owner and their respective successors and assigns.

ARTICLE XVI. SEVERABILITY; GOVERNING LAW; CHOICE OF FORUM. If any provision of the Contract shall be held invalid or unenforceable by a court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provision hereof. The Contract shall be governed by the laws of the State of California. Any action or proceeding seeking any relief under or with respect to this Agreement shall be brought solely in the Superior Court of the State of California for the County of Merced, subject to transfer of venue under applicable State law, provided that nothing in this Agreement shall constitute a waiver of immunity to suit by Owner.

ARTICLE XVII. AMENDMENTS. The terms of the Contract shall not be waived, altered, modified, supplemented or amended in any manner whatsoever except by written agreement signed by the parties and approved or ratified by the Governing Board.

ARTICLE XVIII. ASSIGNMENT OF CONTRACT. The Contractor shall not assign or transfer by operation of law or otherwise any or all of its rights, burdens, duties or obligations without the prior written consent of the surety on the payment bond, the surety on the performance bond and the Owner.

ARTICLE XIX. WRITTEN NOTICE. Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified or overnight mail to the last business address known to the person who gives the notice.

Contractor Name
Address

Merced City School District

_____
SIGNED BY (Contractor)

_____
Julianna Stocking
Superintendent

_____
CALIFORNIA CONTRACTOR'S
LICENSE NO.

_____
LICENSE EXPIRATION DATE

NOTE: Contractor must give the full business address of the Contractor and sign with Contractor's usual signature. Partnerships must furnish the full name of all partners and the Agreement must be signed in the partnership name by a general partner with authority to bind the partnership in such matters, followed by the signature and designation of the person signing. The name of the person signing shall also be typed or printed below the signature. Corporations must sign with the legal name of the corporation, followed by the name of the state of incorporation and by the signature and designation of the chairman of the board, president or any vice president, and then followed by a second signature by the secretary, assistant secretary, the chief financial officer or assistant treasurer. All persons signing must be authorized to bind the corporation in the matter. The name of each person signing shall also be typed or printed below the signature. Satisfactory evidence of the authority of the officer signing on behalf of a corporation shall be furnished.

SECTION 021000 - SITE PREPARATION & PLANT PROTECTION

PART 1 GENERAL

1.01 DESCRIPTION

A. Preserve and protect existing trees, shrubs and other improvements and adjoining properties during removal work, site preparation work and construction. This Section includes root trimming of existing trees that interfere with, or are affected by, execution of the Work, whether temporary or permanent.

1.02 QUALITY ASSURANCE

A. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed tree protection and root trimming work similar to that required for this Project and that will assign an experienced qualified arborist to Project site during execution of tree protection and root trimming.

B. Arborist Qualifications: An arborist certified by ISA or licensed in the jurisdiction where Project is located.

C. Tree Pruning Standard: Comply with ANSI A300 (Part 1), “Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Pruning).”

D. Pre-installation Conference: Conduct conference at Project site to comply with requirements in the General Conditions.
   1. Before tree protection and root trimming operations begin, meet with representatives of authorities having jurisdiction, Owner, Architect, consultants, and other concerned entities to review scope of tree protection and trimming procedures and responsibilities.

E. Tree Protection Zone is defined as the area enclosed by the Temporary Tree Protection Fence.

F. Stipulations
   1. Plant Protection:
      a. Protect trees against cutting, breaking, skinning and bruising of bark; permit no traffic or stockpiling within drip line.
      b. Do not change earth surface within drip line of trees, unless otherwise directed on the drawings.
      c. Do not park vehicles or store materials, supplies and construction equipment within drip line of trees.
      d. Install a temporary fence around the tree(s) as designated on the plans.
      e. Hire the services of a certified arborist to obtain specific instructions for pruning of trees, or disturbance of soil within spread of tree branches and for removal of roots.
      f. Any trenching required within the root zone shall be done by hand and as directed by the certified arborist.

g. Provide watering for all planting within Contract limit and any adjacent areas affected by the work.

G. Plant Replacement
1. Replace trees cut or severely damaged during the contract period. Determine tree value by formula adopted by the National Shade Tree Conference 1951 and 1955. Replace in cash value.
2. A qualified arborist may be retained by the Owner to determine the condition of trees in question as to their ability to survive. Comply with recommendations to rehabilitate or to replace in accordance with paragraph above.

H. Site Preparation and Demolition
1. Work is in accordance with the Drawings and specifications and includes but is not necessarily limited to the following:
a. Clearing and grubbing.
b. Identification and protection of vegetation indicated to remain.
c. Removal of existing site improvements, such as paving, curbs, gutters, fences, utilities, and structures.
2. Locate and identify existing utility services and disconnect, remove and cap.
3. Remove, store and protect all items designated and directed to be reinstalled.

I. Related work specified elsewhere includes:
1. Section 024000 – Demolition
2. Section 029340 – Planting
3. Section 031200 – Earthwork
4. Section 321100 – Base Courses

1.04 SUBMITTALS

A. Record Drawings: Indicate points of disconnection and capping, abandonment and removal of existing utility services; include utility names, sizes and locations, relationship to permanent structures located on site and on adjacent property, and certificates of severance of utility services from respective utility companies or owners. Submittals to be as specified in the General Conditions requirements.

B. Where encroaching into the public right-of-way, contact the Owner's Representative or governing authorities and if necessary, apply for and obtain a Utility Trench Master Permit.

C. Where photographs sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

D. Herbicide: Submit a written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by Construction Manager.

1.05 PROJECT CONDITIONS

A. Coordination: Coordinate this work with the work of other Sections to avoid delay and interference with other work.

B. Nuisances: Keep dirt, dust, noise and other objectionable nuisance to a minimum. Use temporary enclosures, coverings and sprinkling, and combinations thereof, as necessary to limit dust to lowest practicable level, except do not use water to the extent that it causes flooding or contaminated run-off.

C. Traffic: Conduct work to ensure minimum interference with vehicular and pedestrian traffic, and to permit unencumbered access to site and adjacent properties.
   1. Do not close or obstruct streets, sidewalks, alleys or other public passageways without permission from authorities having jurisdiction.
   2. If required by governing authorities, provide alternate routes around closed and obstructed traffic ways.

D. Protections:
   1. Prevent movement and settlement of adjacent structures. Install temporary barriers, fences, guard rails, enclosures, shoring, bracing, planking, barricades, lights, warning signs and other protections required to protect structures, utilities, landscaping and other items that are to remain in place.
   2. Protect bench marks, monuments and reference points from displacement and damage; and if displaced or damaged, replace at no cost to the Owner.
   3. Install and maintain required bracing, shoring and supports when removing structural elements and be responsible for safety and support of structure. If safety of structure appears to be endangered, cease operations and immediately notify the Owner. Do not resume operations until safety is restored.

PART 2 PRODUCTS

2.01 MATERIALS

A. Tree Protection Chain-Link Fence: Metallic-coated steel chain-link fence fabric of 0.120-inch diameter wire; a minimum of 48-inch high; with 1-5/8-inch diameter top and bottom rails; 2-3/8-inch diameter terminal and corner posts; minimum of two bolted clamps required to join fence section; stand; and other accessories for a complete fence system.

B. Sandbag: Refer to the Drawings.

C. Organic Mulch: Wood and bark chips, free of deleterious materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas in which work is to be performed. Report in writing to the Owner's Representative all prevailing conditions that will adversely affect satisfactory

execution of work. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Starting work constitutes acceptance of the existing conditions and the Contractor shall then, at his expense, be responsible for correcting all unsatisfactory and defective work encountered.

3.02 TREE PROTECTION PREPARATION

A. Temporary Fencing: Install temporary fencing around tree protection zones to protect remaining trees and vegetation from construction damage. Maintain temporary fence and remove when construction is complete.
   1. Install chain-link fence according to ASTM F 567 and manufacturer's written instructions.

B. Protect tree root systems from damage caused by runoff or spillage or noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

C. Mulch areas inside tree protection zones and within drip line of trees to remain and other areas indicated.
   1. Apply 2-inch average thickness of organic mulch. Do not place mulch within 6-inches of tree trunks.

D. Do not store construction materials, debris, or excavated material inside tree protection zones. Do not permit vehicles or foot traffic within tree protection zones; Prevent soil compaction over root systems.

E. Maintain tree protection zones free of weeds and trash.

F. Do not allow fires within tree protection zones.

3.03 EXCAVATION

A. Install shoring or other protective support systems to minimize sloping or benching of excavations.

B. Do not excavate within tree protection zones, unless absolutely necessary and approved in writing by arborist.

C. Where excavation for new construction is required within tree protection zones, obtain approval in writing from arborist prior to excavation. Hand clear and excavate to minimize damage to root systems. Use narrow-tine spreading forks and comb soil to expose roots.
   1. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3-inches back from new construction.
   2. Do not allow exposed roots to dry out before placing permanent backfill.

Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

D. Where utility trenches are required within tree protection zones, obtain approval in writing from arborist prior to excavation. Tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.
   1. Root Pruning: Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots with sharp pruning instruments; do not break or chop.

3.04 TREE PROTECTION

A. Maintain existing trees in a healthy and vigorous condition during course of construction and maintenance period. No construction, demolition, storage, vehicle parking, or work of any other nature is allowed within fenced tree protection zone unless approved in writing by arborist.
   1. Approval of work within tree protection zone does not relieve Contractor of responsibility to maintain tree in a healthy condition.

B. Do not use trees as support posts, power poles, signposts, or as anchorage for ropes, guy wires or similar functions.

C. Do not dump poisonous or deleterious materials on ground within tree protection zone.

D. Do not alter surface drainage patterns within dripline of trees.

E. Maintain irrigation of existing trees to remain in accordance with written instructions of arborist throughout construction period.

F. Perform periodic inspections of existing trees to remain to verify health of tree. Notify arborist if tree appears to be failing in health.

3.05 TREE PRUNING, TO BE PERFORMED BY OTHERS

3.06 TREE REPAIR AND REPLACEMENT

A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to arborist's written instructions.

B. Remove and replace trees indicated to remain that die or are damaged during construction operations that arborist determines are incapable of restoring to normal growth pattern.
   1. Provide new trees of 3-inch minimum caliper size and of a species selected by Landscape Architect when damaged trees more than 6-inches in caliper size, measured 12-inches above grade, are required to be replaced. Plant and maintain new trees as specified in Division 2 Section requirements for exterior plants.

3.07 CLEARING: Remove rubbish and deadwood as well as fences and incidental structures that interfere with the construction as shown on the Drawings and as specified. Obtain verification from Owner's Representative prior to removal.

3.08 GRUBBING

A. Remove all brush, organic materials and debris. When indicated, such materials as topsoil and leaf mold, or other organic materials above the ground surface suitable for use as mulch or topsoil, shall be salvaged and stockpiled.

B. Remove grasses and weeds. Apply systemic weed killer and confirm weed kill prior to removal. Herbicides shall be recommended for this project and these grasses and weeds by a State of California appropriately licensed individual. Herbicides shall be registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted herbicides unless authorized in writing by authorities having jurisdiction. The licensed individual shall review all planting, including, the types and extent of soil preparation, the irrigation systems, drainage patterns, and other project characteristics to verify type, compatibility, and recommend the appropriate herbicide(s) for use. Contractor shall be responsible for all overspray, spreading, runoff, plant health, and other impacts from the use of the herbicide.
   1. When using pesticides and herbicides on school property, the contractor shall post 72 hours prior and leave posting up for 72 hours after. Contractor shall not spray if it is windy. If the herbicide product is not currently on Merced School District’s website or in their binders and files, the contractor shall get product approval from Merced School District’s Risk Management team before applying the herbicide.

3.09 UTILITIES

A. Contact local utility companies 48 hours minimum prior to start of demolition work. Confirm verbal notices and written notices. Verify locations of all utilities entering site and their locations on site.

B. Cooperate with the Owner's Representative, utility companies, adjacent property owners, and other building trades in maintaining, protecting, re-routing or extending utilities passing through work areas which serve structures located on project site and on adjacent properties.

C. Verify that utilities that are to be removed, capped or abandoned are turned off, or are disconnected, or are re-routed to new locations before starting demolition.

3.10 REMOVAL

A. General:
   1. Remove materials in an orderly and careful manner.
   2. Repair or replace all removal work performed in excess to that required at no cost to the Owner. Repair or replacement shall match and equal construction, condition and finish existing at time of award of Contract.

B. Remove the following from locations designated on the drawings and to the extent required or directed for new construction.
   1. Slabs, equipment pads and sidewalks, pavement, including underlying base material, and gravel.
   2. Asphalt and concrete paving.
   3. Fencing, including posts, fabric and footings.
   4. Designated utility services occurring within removal areas, including disconnection, capping and complete removal or abandonment.
   5. Trees designated for removal or demolition on the Drawings: Remove all associated root to at least 24 inches below final or proposed finish grade or finish surface.
   6. Miscellaneous structural elements which interfere with the new construction and as directed by the Owner's Representative.
   7. Ballfield backstops benches, infield soil.
   8. Fitness equipment.

C. Cutting asphalt, concrete curb and concrete pavement:
   1. All lines shall be marked and accepted by Owner's Representative before the cutting operation.
   2. Cut edges of pavement at 90-degree angle to the surface in a true and straight line in accordance with dimensions shown on the Drawings. Make cuts with a concrete saw, to a 1-1/2" minimum depth.

D. Backfill and compact areas excavated and open pits and holes resulting from removal operations. Comply with requirements specified in Earthwork section for backfill materials, compaction and installation methods.

E. Rough grade site within removal areas to meet adjacent contours and to provide positive drainage. Leave site in clean condition acceptable for performance of subsequent construction operations.

3.11 CLEANUP AND DISPOSAL

A. Transport trash, rubbish and debris daily from site and legally dispose of.
   1. Remove and promptly dispose of contaminated, vermin-infested and dangerous materials encountered.
   2. Do not burn or bury materials on site.

B. Clean excess soil may be distributed on site as accepted by the Engineer, if it does not adversely affect specified finish grades.

C. Disposal: Remove excess excavated material and displaced trees from Owner’s property.

D. Upon completion of work under this Section, remove all tools, equipment and temporary enclosures and structures.

END OF SECTION

SECTION 024000 - DEMOLITION

PART 1 GENERAL

1.01 SUMMARY

A. Removing above-grade site improvements within limits indicated.

B. Disconnecting, capping or sealing, and abandoning site utilities in place.

C. Disconnecting, capping or sealing, and removing site utilities.

D. Disposing of objectionable material.

E. Demolition and Removal of Fences and Fence Post Footings, including ballfield backstops.

1.02 RELATED SECTIONS

A. Section 02 10 00 – Site Preparation and Plant Protection.

B. Section 31 23 00 – Excavation and Fill.

C. Section 31 23 33 – Trenching and Backfill.

1.03 RELATED DOCUMENTS

A. California Building Code: Chapter 33 – Site Work, Demolition and Construction.

B. California Building Code: Section 1809A.14 – Pipes and Trenches.

1.04 FIELD CONDITIONS

A. Hazardous Materials: Report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.

2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures because of building operations or processes performed there.

1.05 DEFINITIONS

A. ANSI: American National Standards Institute.

B. CAL-OSHA: California Occupational Safety and Health Administration.

C. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.

1.06 SUBMITTALS

A. Follow Submittal procedure outlined in Division 01 Specifications.

1.07 PROJECT CONDITIONS

A. Except for materials indicated to be stockpiled or to remain the Owner's property, cleared materials are the Contractor's property. Remove cleared materials from site and dispose of in lawful manner.

B. Salvable Improvements: Carefully remove items indicated to be salvaged and store where indicated on plans or where designated by the Owner. Avoid damaging materials designated for salvage.

C. Unidentified Materials: If unidentified materials are discovered, including hazardous materials that will require additional removal other than is required by the Contract Documents, immediately report the discovery to the Owner. If necessary, the Owner will arrange for any testing or analysis of the discovered materials and will provide instructions regarding the removal and disposal of the unidentified materials.

D. Hazardous materials: It is not expected that hazardous materials will be encountered in the work.

1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify architect and Owner. Hazardous materials will be removed by owner under a separate contract.

E. On-Site storage or sale of removed items or materials is not permitted.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. Backfill excavations resulting from demolition operations with on-site conforming to structural backfill defined in Section 31 23 00 – Excavation and Fill.

2.02 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning Demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 EXECUTION

3.01 PREPARATION

A. Protect and maintain benchmarks and survey control points during construction.

B. Protect existing site improvements to remain during construction.

C. Inventory and record the condition of items to be removed.

3.02 RESTORATION

A. Restore damaged improvements to their original condition, as acceptable to the Owner.

B. Below-Grade Areas: Completely fill below grade areas and voids resulting from building demolition operations with existing soil

C. Site grading: Uniformly rough grade area to flow to existing drains.

3.03 UTILITIES

A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

B. Arrange to shut off indicated utilities with utility companies or verify that utilities have been shut off.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless authorized in writing by the Owner, and then only after arranging to provide temporary utility services according to requirements indicated.

D. Coordinate utility interruptions with utility company affected.

E. Do not proceed with utility interruptions without the permission of the Owner and utility company affected. Notify Owner and utility company affected two working days prior to utility interruptions.

F. Excavate and remove underground utilities that are indicated to be removed.

G. Securely close ends of abandoned piping with tight fitting plug or wall of concrete minimum 6-inches thick.

H. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations.

3.04 SITE IMPROVEMENTS/DEMOLITION

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove slabs, paving, curbs, and gutters, as indicated. Where concrete slabs, curb, gutter and asphalt pavements are designated to be removed, remove bases and subbase to surface of underlying, undisturbed soil, unless otherwise noted on the plans.

C. Unless the existing full-depth joints coincide with line of pavement demolition, neatly saw-cut to full depth the length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.

D. Remove driveways, curbs, gutters and sidewalks by saw cutting to full depth. If saw cut falls within 30-inches of a construction joint, expansions joint, score mark or edge, remove material to joint, mark or edge.

E. Explosives: Use of explosives is not permitted.

3.05 BACKFILL

A. Place and compact material in excavations and depressions remaining after site clearing in conformance with Section 31 23 33 – Trenching and Backfill.

3.06 DISPOSAL

A. Remove surplus obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off the Owner's property.

END OF SECTION

SECTION 027900 - BASEBALL FIELD SURFACING

PART 1 GENERAL

1.01 DESCRIPTION

A. The extent of work in this section includes the provision of materials and labor for the construction of all infield mix for baseball and softball infield surfacing.

1.02 QUALIITY ASSURANCE

A. Standards: Unless otherwise shown or specified, all materials and methods shall conform to the appropriate current sections of:

1. The State of California, Department of Transportation Standard Specifications (DTSS).
2. Applicable ASTM Specifications as they reasonably apply to this work.

B. Tolerances: Tolerances for subgrade, subbase, and finish grade shall be as specified by DTSS except that the Contractor shall deliver the full infield mix thickness shown. No combination of high and low tolerances that compromise the section will be permitted.

C. Related work specified elsewhere:
1. Section 021000 – Site Preparation & Plant Protection
2. Section 312000 – Earthwork

1.03 SUBMITTALS

A. Soil Sterilent: Submit written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by the Owner's Representative and/or the Owner's appropriately licensed individual.

B. Infield Mix: A one-quart sample with supplier and source clearly indicated of infield mix to be used shall be submitted to the Owner's Representative for review prior to delivery to the site.

C. Mixing Facilities: Method or supplier source for product shall be submitted to the Owner's Representative with sufficient notice so inspection of batching and mixing operations can be made.

D. Reviews: Contractor shall stake and layout all areas for review by the Owner's Representative prior to excavation.

PART 2 PRODUCTS

2.01 MATERIALS

A. Infield Mix: Per plans.

B. Soil Sterilent: Shall be a commercially available herbicide as recommended for this project by a State of California appropriately licensed individual. Herbicides shall be registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted herbicides unless authorized in writing by authorities having jurisdiction. The licensed individual shall review the type of construction, soils, base, adjacent plantings, time and season of application, and other project requirements; verify compatibility; and recommend procedures for proper application. Contractor shall be responsible for all overspray, spreading, or runoff of material into adjacent areas. Products listed above are for Contractor's general reference only as these products may not be suitable for all conditions of the site.

1. Contractor shall coordinate application of soil sterilent with the District and their schedule.

PART 3 EXECUTION

3.01 INSTALLATION

A. Soil sterilent shall be applied to the subgrade soil of areas to be paved; uniformly applied per manufacturer's recommendations; minimum rate of 2.5 to 3.0 lbs./1000 square feet and watered with a minimum of 3 gallons/100 square feet. Contractor shall take all precautions necessary to avoid spray onto or runoff into planting areas.

B. Placement: Infield mix shall be deposited in such a manner as to minimize the necessity for spotting, picking up, or otherwise shifting the mixture. The mixture shall be leveled by raking and compacted by use of light roller. The mixture shall not be screeded off or finished by floating. No steel tooling of edges shall be done.

C. Grades: The finish grades of the infill mix surface shall conform to the lines and grades on the drawings and allow for drainage. Surface of mix at edges shall be flush with adjacent turf finish grade, headers, concrete, or AC paving, unless otherwise noted on the plans.

3.02 CLEAN-UP

A. Waste Removal: All waste incurred as a result of infield mix construction shall be removed from the site and disposed of legally. All excess infield mix shall be removed from planting area.

END OF SECTION

SECTION 028100 - IRRIGATION

PART 1 GENERAL

1.01 DESCRIPTION

A. Work under this section includes all labor, materials, equipment, tools, accessories, transportation, and services as required for the proper installation and construction of a complete and fully automatic, electrically operated irrigation system. Work includes all elements relating directly to the irrigation system from the point of water connection to the most distant sprinkler head and includes furnishing of all labor, tools, materials, etc. necessary for installation. Details of installation and construction shall conform to the plans and these specifications.

B. Where a new irrigation system is designed per the drawings, the system shall efficiently and evenly irrigate all areas, shall be complete in every respect, and shall be left ready for operation to the satisfaction of the Construction Manager. Where existing irrigation is disturbed or damaged due to utility trenching operations or work related to trenching and utility improvement work, existing irrigation shall be repaired or renovated as required to provide a system equal or better than the existing condition.

C. The routing of pipes and conduits shown on the drawings are diagrammatic and it is the Contractor's responsibility to efficiently install said items to best function along with all other improvements. Wherever possible, install irrigation equipment within planting areas.

D. Before proceeding with any work, the Contractor shall carefully check and verify all dimensions and shall report any variations to the Construction Manager.

E. The Contractor shall consult all other sections to determine the extent and character of related work and to properly coordinate work specified herein with that specified elsewhere to produce a finished workmanlike installation satisfactory to the Construction Manager. Existing and proposed storm water and utility systems shall be located on site by the Contractor, and any conflicts with the proposed irrigation system shall be addressed prior to start of work.

F. The irrigation control system shall feature a two-wire output module for control of up to 75 standard 24 VAC solenoid valves over a single pair of wires. The new two-wire output module shall fit into a preexisting module slot in the existing controller backplane and may coexist with conventional output modules featuring individual wires per solenoid valve.

1.02 REFERENCE STANDARDS

A. All work shall conform to State and local codes.

B. California Plumbing Code and locally adopted amendments.

C. American Water Works Association (AWWA)

1.03 SECTION INCLUDES THE FOLLOWING ITEMS TO BE FURNISHED AND INSTALLED

A. 2-Wire Decoder Expansion Module for existing irrigation controller

B. Booster pump assembly

C. Flow sensor and master control valve

D. Remote control valves

E. Quick coupler valves

F. Irrigation main lines, including thrust blocks, and mechanical joints

G. Valve boxes for remote control valves, shut-off valves, and 2-wire decoders.

H. 2-Wire decoders

I. Main shut-off valves

J. Branch irrigation lines (laterals)

K. Rotors and bubblers

L. Pull or Splice boxes, with low voltage wires

M. Fittings, strainers, bubbler heads and sprinkler heads

N. Irrigation accessories

O. Sleeve pipe

P. Conduit pipe

Q. Mechanical joint fittings and joint restraints and service saddles

1.04 COORDINATION AND INSTALLATION OF WATER AND ELECTRICAL SUPPLY FOR IRRIGATION SYSTEM

A. Connection of irrigation system to the water supply: The points of connection for the irrigation system shall be at the approximate locations shown on the irrigation plan(s). Locate points of connection beneath a non-turf planting area.

B. The Owner will bear the cost of normal water requirements during construction.

C. Connection of existing irrigation system serving areas beyond the project limits: Field determine all existing main line pipes, valves, and control wires that service irrigation systems scheduled to be preserved.

1.05 SUBMITTALS

A. Product Data: Required for each element of irrigation system before beginning work.

B. Shop Drawing: System layout including wiring; wiring schematic; controller chart.

C. Design Data, Test Reports, Certificates, Manufacturer Instructions, Mfr. Field Reports.

D. On request, Contractor shall provide Owner with particle size sieve analysis of bedding sand and aggregate base showing compliance with specifications.

E. Closeout:
1. Reproducible record drawing of irrigation plan with copy of CAD and PDF files, keys to controller enclosures, shut off valves, and quick couplers.
2. One complete set of manufacturer's warranties, guarantees, instruction sheets, parts lists and operational manuals shall be delivered to the Owner before acceptance of the contract. Final inspection shall not be made until the sets are approved.
3. Contractor shall program the irrigation controller and accessories and instruct the Owner's maintenance personnel in its operation.
4. Contractor shall meet with the Owner's maintenance personnel to review the irrigation system and operation. Contractor shall provide the Owner with any equipment needed to adjust or operate the irrigation system.

1.06 QUALITY ASSURANCE

A. Verify available water pressure at point of connection prior to construction of irrigation system. Report results to Construction Manager.

B. Valve boxes shall not be installed in paved areas.

C. Contractor shall specifically request the following reviews prior to progressing with the work. Requests for reviews must be received in writing at least 48 hours in advance:
1. Pressure testing and trench depths.
2. Operation of system and coverage adjustment of all heads.
3. Final inspection (End of maintenance)

D. Regulatory Requirements: Work and materials shall be in accordance with latest rules, regulations, and other applicable State and local laws. Nothing in Construction Documents is to be construed to permit work not conforming to these codes.

E. Record Drawings:
1. Contractor shall regularly update plans of the systems and any changes made to the system throughout the project. Underground installations shall be indicated with at least two measurements from surface features such as walks sand buildings. All changes shall be recorded on this plan before trenches are backfilled. The record drawing shall be made by the Contractor, completed and submitted to the Owner before payment shall be made for work installed.

F. Related work specified elsewhere:
1. Section 021000 – Site Preparation & Plant Protection
2. Section 26000 – General Electrical Requirements
3. Section 029110 – Landscape Soil Preparation
4. Section 029350 – Landscape Maintenance
5. Section 312333 – Trenching and Backfilling

6. Section 320523 – Concrete for Exterior Improvements
7. Section 330516 – Utility Structures

1.07 WARRANTY

A. All workmanship and materials hereunder shall be guaranteed for two years, from date of final acceptance, against defective workmanship and materials. This includes filling and repairing depressions and replacing plantings due to settlement of irrigation trenches. The Contractor is not responsible for vandalism or theft after date of final acceptance.

B. All components of the 2-wire irrigation system shall have a 5-year manufacturer's warranty.

1.08 MAINTENANCE

A. Per Section 029350 – Landscape Maintenance.

1.09 APPLICATIONS

A. Automatic irrigation system is required for all landscaped areas of the site, as shown on the Irrigation Plan(s).

1.10 RESTRICTIONS

A. Except as specified, drip irrigation and quick coupler (e.g., manually operated) irrigation systems are prohibited.

B. Asbestos cement (A.C.) pipe is not acceptable for new pipe.

1.11 RELATED DOCUMENTS

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

PART 2 PRODUCTS

2.01 MATERIALS SUMMARY

A. All irrigation equipment specified on the drawings or these specifications are sole source (no substitutions), unless otherwise noted. Refer to drawings.

2.02 MATERIALS

A. Rock-free Soil: Native or import soil free of rocks, roots, sticks, clods, debris, and other foreign matter over 1 inch in longest dimension.

B. Bedding Sand:
1. Course, clean sand meeting the following specifications
Sieve Size Percent Passing

a. #4 75-100	75-100
b. #50 0-70	0-70
c. #100 0-30	0-30
d. #200 0-15	0-15

C. Pea Gravel: Clean, washed, natural stone with maximum particle size of 1/2" inch.

D. Aggregate Base: Caltrans Standard Specifications, Section 26, Class 2 Aggregate Base

2.03 COMPONENTS

A. The components will be as specified: All materials shall be new unless otherwise noted. Any deviation from the specifications must first be approved by the Owner in writing. All materials shall be clearly marked by manufacturer on all material containers or certificates of contents for inspection.

B. 2-Wire Decoder Expansion Module for Existing Irrigation Controller: 2-Wire decoder expansion module shall be as indicated on the plans.

C. Booster Pump Assembly: Booster pump assembly, including enclosure

D. Flow Sensor and Master Control Valve: Flow sensor and master control valve shall be as indicated on the plans.

E. Remote Control Valve: Remote control valve shall be as indicated on the plans.

F. Quick Coupler Valve: Quick coupler valve shall be as indicated on the plans.

G. PVC Pipe -General:
1. All plastic PVC pipe shall be manufactured by J-M or PW Pipe Co., or an approved equal. Pipe have continuous permanent marking identifying Manufacturer's name, kind of pipe, material, grade, size NSF approved, date of extrusion and schedule of type. The manufacturer shall also mark the date of extrusion on his pipe. This dating shall be done in conjunction with records to be held by the manufacturer for two years covering quality control tests, raw material batch numbers, and any other information deemed necessary by the manufacturer. Guarantee shall cover workmanship of materials from the plastic pipe manufacturer for all plastic pipe and fittings. Polyethylene is prohibited.
2. PVC Schedule 40 & Schedule 80 shall be manufactured in accordance with ASTM D1785, and is listed with NSF-PW Standard 61 & Standard 14.
3. Pipe Size:
    a. Main irrigation lines shall be per plan.
    b. Lateral irrigation lines shall be per plan.
    c. One-half inch pipes are prohibited.

H. Galvanized Pipe: Galvanized pipe shall conform to the American Water Works Association Standard C400-80. All pipe upstream of existing backflow preventer shall be lead free.

I. Copper pipe and fittings ahll be Type K per ASTM B88.

J. Brass pipe and nipples shall be red brass per ASTM B687.

K. Bronze fittings per ASTM B62 and ASTM B584.

L. Sleeves: As indicated on plan, with solvent weld joints.

M. Fittings - General: As shown in irrigation details. All fittings shall have connections compatible with the type of pipe joint selected by the Contractor, and all fittings upstream of existing backflow preventer shall be lead free. Pipe fittings shall be of the same material as pipe where applicable and recommended by the pipe manufacturer for the particular type of pipe to which they are to be connected and shall conform to the requirements of one of the following specifications:

1. PVC: PVC Schedule 80 molded, high impact, standard weight; slip-joint solvent weld type. ASTM D2467, ASTM D1784 and ASTM D1785, Type 1, with appropriate pressure rating, as manufactured by Spears, Lasco, or approved equal. All Schedule 80 PVC couplings, four (4) inches in diameter or larger, shall be a minimum of seven (7) inches in length.
2. Ductile Iron Mechanical Joint Fittings and Joint Restraints and Service Saddles: Per plan.
3. Galvanized pipe-fittings shall conform to the requirements of the AWWA Committee 8620D report, "Collected Standards for Service Line Materials." Galvanized pipe shall be extended by means of couplings. Couplings, elbows, tees, and other fittings shall be galvanized conforming to the above requirements.
4. Cast Iron pipe-fittings shall conform to the American Water Works Association Standard C-110-52, "Short Body Cast Iron Fittings, 3 inch to 12 inch for 250 psi Water Pressure Plus Water Hammer". Cast iron pipe joints shall be the "push-in" type sealed by means of rubber gaskets. Cast iron fittings shall be used on existing A.C. mains and shall be Tifco or approved equal. A.C. pipe is no longer acceptable for new pipe.

N. Mainline Shut-Off Valves: All mainline shut-off valves shall be brass gate valves or ductile iron per plan. Manufacturer shall be as indicated on the plans. A valve box and cover of adequate size to allow maintenance freedom shall be installed over each main shut-off valve in the system. See irrigation plan(s) and details for proper box installation. Valve shall be 125 psi test water pressure unless otherwise specified.

O. Quick Coupler Valves: Quick coupler valves shall be as indicated on the plans.

P. Sprinkler heads:

1. Rotators, Rotor or Bubbler Heads: Rotators, rotor or bubbler heads shall be as indicated on the plans.

Q. Swing Joints: Swing joints for sprinkler heads shall be as indicated on the plans.

R. The two-wire output module shall be manufactured by the same manufacturer as the controller and shall carry all the same necessary approvals and compliance as the host controller.

S. 2-Wire Output Module: 2-Wire output module shall be as indicated on the plans.

T. 2-Wire Field Decoder: 2-Wire Field Decoder shall be as indicated on the plans.

U. 2-Wire Field Wiring
1. The field decoders shall have color-coded wires to facilitate proper connection to the two-wire path and to the valve solenoid. There shall be no polarity on the two-wire path, which means it does not matter which path wire is connected to which incoming lead, and there shall be no polarity on the output wires to the 24 VAC solenoid.
   a. All field decoder connections shall be made with gel-filled or similar waterproof splice connectors designed for standard in-ground landscape irrigation purposes.
   b. Wiring between the two-wire output module and the field decoders shall consist of direct-burial-rated standard irrigation wiring of an appropriate diameter for the maximum distances per the manufacturer's specifications.
      1. American 14 AWG or international 2 mm^2 shall be the minimum sizes in professional installations for tensile strength and longevity.
   c. Run wiring in conduit, per plan, for wire resistance to pests.
   d. Wiring shall be as indicated on the plan.

V. Electrical Equipment and Wiring: Electrical wiring, fittings, and appurtenances shall conform to the requirements of the following specifications: Type UF with 4/64" U.L. listed insulation for underground burial for Class II circuits.
1. The underground conductor that serves the master valve and flow sensor shall be of the size specified under this section. The insulation shall be 4/64 inches, U.L. approved Type U.F. and shall be able to withstand a crush test of 5000 psi.
   a. The spare wires used when necessary shall be black.
2. The control wires to the master valve shall be 12 gauge color-coded red.
   a. Separate wires shall run from the controller to the master valve.
3. The wires to the flow sensor shall be per plan.
4. Common or neutral underground conductors shall be 12 gauge color-coded white.
5. Multi strand wire is prohibited.
6. Conductors shall be installed to connect the flow sensor and master valve to the irrigation controller. Wires shall be installed in conduit to the controller per the plans and details. The Contractor shall install wires, per plan, inside of a 1.5- inch electrical (grey) PVC conduit from the flow sensor to the irrigation controller (red and black flow meter wires), and two (2) 14 gauge wires inside of a 1.5 inch electrical (grey) PVC conduit from the master valve to the irrigation controller (blue master valve wire and white field common wire). The wires shall be spliced inside of a #3-1/2 pull box at 200 feet maximum interval between the flow sensor and the controller and the master valve and the controller.
   a. Wire connectors shall be hardened type.

W. Locator or Tracer Wires and Accessories: Locator wires shall be #12 AWG, continuous, bare copper conductor.
1. Locator wires shall be installed on all irrigation main lines. Locator wires are not required to be installed on the lateral lines.

2. The locator wire shall be identified as "Locator Wire" using Thomas and Betts E-Z Code Type SM markers, Plastic Extruded Products, Inc, Wire Markers, or approved equal, and self-locking cable ties.
3. The alpha-numeric characters for cable markers shall be hot stamped machine printed on sleeves with permanent black ink.
4. Printed alpha-numeric character sleeves shall be white PVC tubing resistant to temperature extremes, excessive moisture, common solvents, oils, gasoline, and ultra-violet and gamma radiation.
5. Adhesive strip labels are not acceptable.
6. Marker holders shall be fastened to the wire with a cable tie.
7. All identification devices shall be provided complete with all holders, supports, and fastening accessories at each remote control valve.

X. Solenoid: Single color-coded 14-gauge wire to each solenoid.

Y. Valve ID Tags: Shall be manufactured by Toro or an approved equal.

2.04 ACCESSORIES

A. Solvent and Glue: Per pipe manufacturer. No substitutions.

B. Dielectric connectors: Mandatory at all joints between dissimilar metals.

C. Valve Boxes: Shall be as designated on the Drawings.

D. Pull Boxes: Shall be as designated on the Drawings.

PART 3 EXECUTION

3.01 EXISTING SITE CONDITIONS

A. Locations of existing utilities and other improvements shown on the Drawings are approximate. Existing conditions shall be verified. Should any utilities be encountered that are not indicated on the plans, the Owner shall be notified immediately. The Contractor shall be held responsible for any damages caused to existing services.

B. Existing irrigation components are the property of the Owner. Unless instructed otherwise, all removed irrigation components shall be given to the Owner.

3.02 GRADING

A. Contractor shall be responsible for installing all irrigation features to their finished grade and at depths indicated. All rough grading and/or finish grading shall be completed and/or accommodated before trenching commences.

3.03 LAYOUT

A. Contractor shall not make any changes from the original Drawings without receiving written permission from the Owner's Representative. All changes must be recorded on the record "As-built" drawings prepared by the Contractor.

B. Location of pipe and valves on the Drawings is diagrammatic. Locate pipe and components in landscaped areas and valves near edge of turf, walks, or curbs as much as possible.

3.04 TRENCHING

A. All trenches shall be open vertical construction, sufficiently wide to provide ample working space and depths as specified. PVC pipe may be made up on the surface and then placed in the trench. Do not cut existing tree roots measuring over 2 inches in diameter in order to install sprinkler lines. Where small roots must be cut, excavate around by hand and make clean cuts using a saw or ax.

B. Minimum depth of cover:
1. Mainlines: per plan.
2. Laterals: per plan.
3. Sleeves: per plan.

3.05 BACKFILLING

A. All work must be inspected and approved by the Owner prior to covering. Give Owner a minimum of 48 hours written notice prior to filling trenches. All debris and rocks shall be removed from the trenches. Pipe shall have a firm uniform bearing for the entire length of each pipe line to prevent uneven settlement. Wedging or blocking of pipe will not be permitted.

B. Backfill Material:
1. Mainline: bedding sand around pipe (minimum 2" below, 4" above); remainder to be rock free soil.
2. Laterals: Rock-free soil.
3. Conduit and sleeves under paved areas: minimum 3" of bedding sand around pipe, remainder to be aggregate base.

C. Backfill shall be brought to uniform and optimum moisture content and mechanically compacted in 6" layers, to the following densities per ASTM D1557:
1. Within landscape areas: 85% - 90%.
2. Under pavement: 95%.

3.06 EXECUTION SUMMARY

A. General: The Contractor shall install the specified pipe, valves, fittings, wiring, switches, controls, and appurtenances at the approximate locations indicated on the plans. The Construction Manager shall indicate specific locations.

The Contractor shall provide all temporary storerooms and shops that he may require at the site for the safe and proper storage of his materials, tools, etc. These rooms shall be constructed only in locations approved by the Construction Manager, as

designated on the location map, and must in no way interfere with the work of any other Contractor. At such times as these rooms interfere with the proper installation and completion of the work, they shall be removed by this Contractor at his expense, within three (3) days after having been notified by the Construction Manager that such removal is necessary.

Handling of PVC pipe and fittings: The Contractor is cautioned to exercise care in handling, loading, unloading, and storing PVC pipe; beds on which materials are stored must be full length of pipe to avoid damage. PVC pipe and fittings shall be especially protected from direct sunlight. Any section of pipe that has been dented or damaged shall not be used in the work.

B. Trenching
   1. Uniform and straight with firm and uniform bottom. Mechanical trench diggers used on the site shall be essentially vertical so that a minimum of surface is disturbed. Road patrols or graders shall not be used to excavate the trench with their blades. The bottom surface of trenches shall be essentially smooth and free from coarse aggregate. Trenches for pipe shall be excavated to the depth shown on the plans.
   2. Trenches shall be padded with bedding sand or rock-free soil as noted above. Pipe shall have a minimum cover of bedding sand or rock-free soil as noted above.

C. Setting
   1. Uniform firm bearing for the entire length of line.
   2. Wedging or blocking is prohibited.

D. Thrust Blocks
   1. Required where mechanical joints are note used.
   2. Portland Cement Concrete thrust blocks as specified by the Construction Manager, Class A, 6 sack.

E. Heads
   1. Set to precise elevations 1/2 inch above finish grade (including mulch) and 1 inch above seeded areas, 1/4 inch below and 6 inches away from adjacent pavement, and 2 feet away from building walls.
   2. Set swing joint angles between 20 and 45 degrees.

F. Compaction
   1. Match original density and grade.
   2. Crown for future settlement if original density cannot be achieved.

G. Pipe, Valves Fittings: Thoroughly clean and maintain clear and unobstructed.

H. Sleeves
   1. Required at all sub-pavement irrigation lines.
   2. Use at least 2 nominal pipe sizes larger than irrigation pipe.
   3. Cut squarely with tubing cutter, hand saw or hacksaw and remove burrs.
   4. Remote control wiring shall be installed in separate sleeve.

I. Valves: Mount in line with threaded connections (to be removable).

1. Remote control valves (R.C.V.): Separate valve box required for each valve. Where a R.C.V. is shown at the edge of grasses and shrub area, the intent is that the R.C.V. shall be placed in the shrub area. Contractor shall adjust all remote control valves to completely close within 45 seconds to one minute of shutdown. Contractor shall tag all remote control valves indicating the number of the station in relation to the irrigation controller and irrigation plan.
2. All valves and fittings shall have connections compatible with the type of pipe joint selected by the Contractor.

J. Wiring
1. Run adjacent to pipe in same trench.
2. Refer to plans for additional requirements.
3. Identify additional wires on "as-built" documents.
4. Locate electrical connections at valve boxes with sealant in watertight connectors.
5. Install control wires along-side the mainline wherever possible. Maintain a 3” separation. Install a loop every 100’. Install extra wires as indicated on the Drawings.
6. Install all sensors per Drawings and manufacturer’s instructions. Make all interface connections. Program devices and controller for proper operation.

K. Valve boxes
1. Inconspicuous locations only.
2. Provide vertical separation to prevent contact with main line.
3. Spacing between remote control valves = 1' - 0" minimum; refer to plans for additional requirements.

L. Solvent Weld Joints
1. Contractor shall use only the solvent supplied and recommended by the manufacturer to make plastic pipe joints.
2. The pipe and fittings shall be thoroughly cleaned of dirt, dust, and moisture before applying solvent.
3. The Contractor will make solvent weld joints with non-synthetic bristle brush in the following sequence:
    a. Apply a liberal even coat of purple-colored PVC primer to the pipe and fittings immediately prior to applying the solvent.
    b. Then apply a liberal even coat of solvent to the inside of the fittings and then to the outside of the pipe, making sure that the coated area is equal to the depth of the fitting socket.
    c. Insert the pipe quickly into the fitting and turn the pipe approximately 1/4 turn to distribute the solvent and remove air bubbles. Hold the joint for approximately 15 seconds so the fitting does not push off the pipe.
    d. Use a clean rag and wipe off all excess solvent. This is to prevent weakening at joint.
    e. Be sure that in going to the next joint, the pipe is not twisted, disturbing the last completed joint.
    f. Allow at least fifteen (15) minutes set-up time for each welded joint before moving.

M. Threaded Connections

1. For all PVC threaded connections, use a non-hardening pipe sealant (Weld-On “All Seal”, Spears Blue 75, or approved equivalent) or Teflon tape shall be used on all threaded joints except at sprinklers.
   In no event shall an oil base joint compound be used on a PVC joint. On plastic to steel connections, the Contractor shall work the steel connections first.
2. All galvanized steel threaded connections and exposed threaded areas shall be heavily coated with pipe joint compound.
3. All galvanized or PVC swing joints shall move freely upon installation.

N. Mechanical Joint Fittings, Joint Restraints, and Service Saddles
1. Install per plan.

O. Storage and Installation of Pipe:
1. The Contractor is cautioned to exercise care in handling, loading, unloading, and storing plastic pipe and fittings. All plastic pipe and fittings shall be stored under cover before using, and shall be transported in a vehicle with a bed long enough to allow the length of pipe to lay flat so as not to be subject to undue bending or concentrated external load at any point. Any section of pipe that has been dented or damaged will be discarded until said section of pipe is cut out and rejoined with a coupling.
2. The Contractor shall provide the necessary mason's lines and supports to insure installation of the pipe to line and grade, as staked by the Construction Manager. The Contractor's facilities for lowering the pipe into the trench shall be such that neither the pipe nor the trench will be damaged or disturbed.
3. All pipes shall be assembled free from dirt and pipe scale and shall be reamed and burrs removed. The main line supply shall be flushed out and tested for leaks before backfilling and with control valves in place and before lateral pipes are connected to valves. Each section of lateral pipes shall be flushed out before sprinkler heads are attached.
4. The underground galvanized steel pipe and fittings at the backflow prevention device shall be triple wrapped with plastic.
5. Never lay plastic pipe when there is water in the trench.
6. The Construction Manager shall inspect all pipe before it is laid and reject any section that is damaged by handling or is found to be defective to a degree which will materially affect function and service of pipe.
7. Plastic pipe will expand approximately six inches (6") per thousand feet (1,000') between day and night temperatures in hot climates. Therefore, pipe shall be snaked from side to side of trench bottom to allow for expansion and contraction.
8. All foreign matter or dirt shall be removed from the inside of the pipe before it is lowered into position in the trench, and it shall be kept clean by approved means during and after laying of pipe.
9. Install PVC pipe per manufacturers ’recommendations and ASTM F1668 and as detailed on the Drawings. Handling and assembly of pipe, fittings, and equipment shall be accomplished by skilled tradesmen. Bending of pipe will not be permitted.
10. PVC pipe should never be laid when there is water in the trench; or when the temperature is 32 degrees F or below.
11. Snake pipe from side to side of trench bottom to allow for expansion and contraction.

P. Installation of Conductor in Trenches: Conductors may be installed in the same trench as the water pipe. All clearances between conductors, pipes, and trench walls shall conform to the dimensions shown on the typical cross sections and other details on the plans.

1. Sharp bends or kinks in the conductor shall not be permitted. Conductors shall be unreeled in place alongside or in the trench and shall be carefully placed along the bottom of the trench. Under no condition shall the cable be unreeled and pulled into the trench from one end.
2. Where two or more cables are laid parallel in the same trench, they shall be taped together not less than every 25 feet. Wherever a splice occurs, a valve box shall be installed.
3. Wire splices shall be connected with "Snap-Tite" connectors by Rain Bird, "Splice-Kote" connectors by Global Span Products, Inc., or approved equal. Wire connectors for the Flow Meter shall be hardened type.
4. Not less than one (5) foot of cable slack shall be left on each side of all splices at all points where cable is connected to field equipment. The slack cable shall be placed in the trench in a series of S curves.

Q. Installation of Locator Wires: Strap the locator wire to the top of all main lines and quick coupling valve lines every ten feet (10'). One locator wire is required in every main line and quick coupling valve line trench, spliced per the plans. Loop locator wires into each valve box and attach a plastic identification marker onto the locator wire with a nylon tie.

R. Installation of Pipes under Paving: Where irrigation mains or laterals are to be installed under paving, a Class 315 PVC sleeve shall be installed. The inside diameter of the sleeve shall be a minimum of 2 inches larger than the outside diameter of the main, lateral, or sleeve, which- ever is greater. Cap or plug ends to prevent intrusion of backfill and debris. Backfill per section 3.05.

1. A separate sleeve shall be installed for irrigation control wires. The minimum diameter shall be 2 inches or larger if required to fit wires with room to spare.

S. Installation of Sprinkler Heads: Sprinkler heads including rotor heads in open areas shall be installed at least four inches (4") above finished grade at the time of installation. Within five (5) days of notification by the Construction Manager, Contractor shall, as part of the work under this contract, make whatever adjustments of pipe, fittings, valves, or sprinkler heads necessary to bring the system to the proper level of the permanent grade. At this time, heads shall be made completely firm with sand.

1. Sprinkler heads along walks and driveways, where the finished grade level is established, shall be set flush at the time of installation.

T. Backfilling: The procedure for backfilling shall be the same for trenches with pipe only, conductor only, both pipe and conductor only, or both pipe and conductor or conduit and conductor.

1. All lumber, rubbish, and large rocks shall be removed from the trenches. Pipe shall have a firm, uniform bearing for the entire length of each pipeline to prevent uneven settlement. Wedging or blocking of pipe shall not be permitted.
2. After the pipe and/or conductor have been installed, the trench shall be backfilled to the level shown on the plans with white sand such as Olympia No. 2 (coarse grained sand, dirt and salt free) which shall contain no particles that would be retained on a 1/4" sieve. Sand shall be jetted lightly.

3. The remainder of the backfill shall be topsoil material, which shall not be less than 8 inches deep. Trenches shall not be excessively wet and shall not contain pools of water during backfilling operations.
4. The Contractor shall exercise extreme care while backfilling. Any materials or equipment damaged while backfilling shall be repaired or replaced by the Contractor as directed by the Construction Manager, at no cost to the Owner.

U. Flushing and Disinfecting: After the trench has been backfilled, all water pipes installed shall be flushed clear and clean of all dirt and foreign material. Mains shall be flushed prior to backfilling.
1. Disinfect potable lines per AWWA standards.
2. Flushing: Remove end heads and operate system at full pressure until all debris, dirt, and sand is removed. Divert water to prevent ponding or damage to finished work

V. Testing Pipes: After flushing, mains shall then be submitted to a leakage or pressure test. All tests on pressure lines shall be completed prior to backfilling; however, sufficient sand shall be placed in trenches between fittings to insure the stability of the line under pressure. In all cases, fittings and couplings must be open to visual inspection for the full period of the test. No testing shall be done until the last solvent welded joint has had twenty-four (24) hours to set and cure.
1. All control valves shall be closed. The sprinkler system main shall be slowly filled with water to line pressure.
2. Before testing, all air shall be expelled from the pipe.
3. Where any section of the pipe system is provided with a concrete thrust block, the test shall not be made until at least five (5) days have passed after the concrete thrust block was installed. If higher early-strength cement is used in the concrete thrust block, the test shall not be made until at least two (2) days have elapsed.
4. The duration of each test shall be two (2) hours, and during the test, the system shall be subjected to 120 psi line pressure.
5. Should any section of pipe laid disclose leakage, locate and repair defective pipe or joint and retest.

W. Records Plans: The Contractor shall maintain reasonable clear and detailed records of all underground installations. These records shall be available to the Construction Manager at all times for verification while the work is in progress. These records are part of the work under this contract and shall be delivered to the Construction Manager in a good and acceptable condition prior to final acceptance of the work.

3.07 EARTH GROUNDING

A. The host controller shall be earth-grounded in accordance with the manufacturer's specifications and per plan, ideally to a resistance of 10 ohms or less.

B. The two-wire path shall require earth grounding or surge suppressors as indicated on plan.

3.08 FIELD QUALITY CONTROL

A. Do not stack pipes in trench.

B. Do not run main lines and laterals parallel with storm drainage flows and other areas subject to erosion.

C. Do not mix head-types within a zone.

D. Buried wire splices are prohibited.

E. Pressurize completed mainline for 2 hours at normal pressure (120 lbs. for 1 hour on pump systems).

F. Hydrostatic Tests - Open Trench:
   1. Hydrostatic testing shall be conducted in accordance with the pipe manufacturer's recommended testing procedures and before pipe is covered. Center load pipe with a small amount of backfill to prevent arching or slipping under pressure.
   2. Testing to be accomplished at the expense of the Contractor and in the presence of the Owner's Representative. Request the presence of the Owner's Representative in writing at least 48 hours in advance of testing.
   3. Testing:
      a. PVC mainline: Apply continuous static water pressure of 100 psi for four hours after welded plastic joints have cured at least 24 hours. Pipe shall be free of air at time of testing.
      b. PVC lateral: Apply continuous static water pressure of 100 psi for two hours after welded plastic joints have cured at least 24 hours. At time of testing, pipe shall be free of air and risers capped.
   4. Repair leaks resulting from tests; and repeat tests.

G. Test heads in each valve zone for 10 minutes minimum.

H. Operate controller through two complete cycles or each zone for two minutes minimum.

I. Repair leaks and repeat above tests.

J. Flush entire system for 2 minutes at normal operational pressure immediately before installing heads, nozzles, or plugs. Removable nozzle heads may be installed prior to flushing.

K. Test to determine that irrigation system functions according to manufacturer's data and gives full coverage according to intent of the Drawings. If not functioning as specified correct system to provide satisfactory performance.

L. System Acceptance Requirements
   1. No leaks during any test procedure
   2. Pattern coverage per design.

M. Complete all of the above before commencing sod or seeding operations.

N. Potable and recycled water mains shall have a 10-foot minimum horizontal separation. Vertical mainline separations are to be per the State of California Health Services crossover requirements.

O. Visual Inspection: Pipe shall be homogenous throughout and free from visual cracks, holes, or foreign materials. Inspection shall be made on each length of pipe. All materials are subject to impact test at the discretion of the Owner's Representative.

3.09 PROTECTION

A. Contractor shall be responsible for protection of existing irrigation and utilities within and immediately adjacent to the construction area; and repair, to the satisfaction of the Owner, any damages to irrigation and utility lines that occur as a result of operations of this work.

B. Provide water and controls to existing adjacent irrigation system continuously through project as shown on the Drawings.

C. Irrigate existing plant material continuously through the project as needed.

D. Provide and install adequate warnings and barriers to prevent damage or injuries from irrigation operations and equipment.

3.10 ADJUSTING/CLEANING

A. Clean-up daily; remove all debris and surplus materials from the site.

B. Tighten pop-up nozzles.

C. Adjust radius and gallonage settings on heads with adjustable stems.

D. Perform final adjustment of head levels and coverages during turf and plant establishment.

E. Immediately clean up any soil, sand, or debris spilled onto streets, parking areas, and sidewalks and properly dispose legally off site. Sweep and/or wash all dirt and mud off paved areas.

F. During all phases of the construction work, the Contractor shall take precautions to abate dust nuisance by cleanup, sweeping, sprinkling with water, or other means as necessary.

3.11 DEMONSTRATION

A. Demonstrate and test system operation and performance in the presence of system designer, Construction Project Manager, and Owner's Operations Personnel for the following items: use of controller, water flow in all lines, irrigation head coverage and rain gauge. After the system has been completed, the Contractor shall instruct the Construction Manager and Owner's Operations Personnel in the operation and maintenance of the system and shall furnish a complete set of operating instructions prior to final acceptance.

3.12 RECORD DRAWINGS

A. Contractor shall regularly update plans of the systems and any changes made to the system throughout the project. Underground installations shall be indicated with at least two measurements from surface features such as walks sand buildings. All changes shall be recorded on this plan before trenches are backfilled. The record drawing shall be made by the Contractor, completed and submitted to the Owner before payment shall be made for work installed.

END OF SECTION

SECTION 028700 - SITE FURNISHINGS

PART 1 GENERAL

1.01 DESCRIPTION

A. Furnish and install all site furnishings shown on drawings and specified in accordance with the manufacturer's instructions and as shown on the drawings and as specified.

1.02 REFERENCES

A. Perform work in accordance with all applicable laws, codes and regulations required by the City and the State of California.

B. Manufacturer’s Instructions: Where required in the Specifications that materials, products, processes, equipment or the like to be installed or applied in accordance with manufacturer’s instructions, directions or specifications, or words to this effect, it shall be constructed to mean that said application or installation shall be in strict accordance with printed instructions furnished by the manufacturer of the material for use under conditions similar to those at the job site.

C. Reference Standards:
1. State of California, Business and Transportation Agency, Department of Transportation: “Standard Specifications.”
2. Manufacturers’ specifications and recommendations.

1.03 QUALITY ASSURANCE

A. Related requirement specifications elsewhere:
1. Section 033000 – Cast In Place Concrete
2. Section 312000 – Earthwork
3. Section 312333 – Trenching and Backfilling
4. Section 320523 – Concrete for Exterior Improvements

1.04 COORDINATION

A. Coordinate items of other trades. Contractor shall be responsible for the proper installation of all accessories embedded in concrete and for the provision of connections, holes, openings, etc., necessary to the execution of the work of the trades.

1.05 SUBMITTALS

A. All Site Furnishing products shall be approved by the Owners’ Representative prior to ordering, purchasing or installing them. Submit product literature that defines the proposed product, including colors, finishes and textures where applicable.

PART 2 PRODUCTS

2.01 SITE FURNISHINGS LIST

A. The following site furnishings shall be provided and installed as shown on the Drawings:
1. Ballfield Backstop
2. Ballfield Pitcher's Rubber
3. Portable Pitcher's Mound
4. Player's Bench
5. Fitness Equipment
6. Drinking Fountain and Bottle Filler
7. Bollards
8. Track and Field Equipment
9. Pickleball Net and Post System
10. Volleyball Net and Post System

PART 3 EXECUTION

3.01 GENERAL INSTALLATION

A. Install manufactured items in accordance with the manufacturer's instruction and as shown in the drawings and as specified herein.

B. Perform all work in accordance with all applicable laws, codes and regulations required by State of California and local codes.

C. Set all work true and square, plumb and level.

D. The minimum concrete slab thickness shall be 6" at the point of mounting and for a minimum horizontal distance of 6" in all directions, as indicated on plans, specifications, manufacturer's recommendations, whichever is greater, where site furnishings are surface mounted.

3.02 CLEAN UP

A. Upon completion of the work under this section, remove immediately all surplus materials, rubbish, and equipment associated with or used in the performance of this work.

END OF SECTION

SECTION 029110 - LANDSCAPE SOIL PREPARATION

PART 1 GENERAL

1.01 DESCRIPTION

A. Furnish and install all landscape soil preparation as shown and specified, including, but not necessarily limited to, the following: topsoil placement, weed removal, fine grading, organic amendment and fertilizer placement, soil scarification, and finish grading.

1.02 QUALITY ASSURANCE

A. Reviews: Contractor shall specifically request at least five days in advance the following reviews prior to progressing with the work:
   1. Completion of rough grading
   2. Completion of regrading of native material
   3. Verification of amendment incorporation depths
   4. Fine grading to establish finish grades

B. Certification: Written certificates stating quantity, type, and composition, weight and origin for all amendments and chemicals shall be delivered to the Construction Manager before the material is used on the site.

C. Soil Samples: Contractor shall provide a one-quart sample of the proposed import topsoil to Lucchesi Plant & Soil Consulting, LLC, info@lucchesiconsulting.com, (408) 337-2575, for their testing for conformance to this specification. No material shall be delivered to the site, placed on-site, graded on-site, or otherwise modified until the Construction Manager approves the material. All testing costs shall be paid for by the Contractor. Contractor shall allow for sufficient time for such testing prior to construction. Testing costs for the initial samples and costs for any additional samples due to non-compliance shall be paid for by the Contractor.

D. Amendment Samples: Contractor shall provide a one-quart sample of each proposed amendment to Lucchesi Plant & Soil Consulting, LLC, info@lucchesiconsulting.com, (408) 337-2575, for their testing for conformance to this specification. No material shall be delivered to the site until the Construction Manager approves the samples. Testing costs shall be paid for by the Contractor.

E. Planting Areas: All areas to be planted, whether in seed, container stock, flats, or otherwise, are defined as planting areas in these documents. Exception: mulch-only areas where designated on the plans, are defined as a planting area, however, these areas will not be cultivated or amended except where plants are installed.

F. Related work specified elsewhere:
   1. Section 021000 – Site Preparation & Plant Protection
   2. Section 029340 – Planting
   3. Section 312000 – Earthwork

4. Section 312300 – Excavation and Fill
5. Section 312333 – Trenching and Backfilling
6. Section 321100 – Base Courses
7. Section 329200 – Turf and Grasses

1.03 SUBMITTALS

A. Submit cut-sheets or samples of all products to be used in conformance with applicable Division Two specifications, General Conditions and Special Provisions. At a minimum, submit information for the following items:
   1. Soil Report for onsite topsoil, import topsoil, and onsite and import bio-retention soil. Soil report shall confirm samples meet all requirements. Lab results shall show the grain size analysis for the sand and the quality analysis for the compost of the onsite and import bio-retention soil.
   2. Documentation of the mixing process for the onsite and import bio-retention soil.
   3. Fertilizer
   4. Soil Amendment
   5. Herbicide: Submit a written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by Construction Manager.
      a. When using pesticides and herbicides on school property, the contractor shall post 72 hours prior and leave posting up for 72 hours after. Contractor shall not spray if it is windy. If the herbicide product is not currently on Merced School District's website or in their binders and files, the contractor shall get product approval from Merced School District's Risk Management team before applying the herbicide.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fertilizer for mass planting: Shall be determined from soils analysis results. For purposes of bidding only, assume the following:
   1. Drainage of the root zone should be improved by first loosening the top 10 inches of any undisturbed or compacted soil. The following materials should then be evenly spread and thoroughly blended with the top 6 inches of soil to form a homogenous layer:

Amount per 1000 Square Feet **Conventional**

4 cubic yards	Composted Greenwaste Organic Amendment* (optional)
7 pounds	Ammonium Sulfate (21-0-0)
2 pounds	Triple Superphosphate (0-45-0)*
40 pounds	Gypsum (Calcium Sulfate)

OR

Amount per 1000 Square Feet **Organic**

4 cubic yards	Composted Greenwaste Organic Amendment* (optional)

6 pounds Blood Meal (12-0-0)
14 pounds Feather Meal (12-0-0)
4 pounds Steamed Bone Meal (3-15-0)*
40 pounds Gypsum (Calcium Sulfate)
*The rate may change based on the analysis of the chosen organic amendment. This rate is based on 270 lbs. of dry weight of organic matter per cubic yard of amendment. If a composted greenwaste amendment is chosen that provides a substantial amount of phosphorus, the steamed bone meal or triple superphosphate should be reduced or omitted accordingly.

For areas where turfgrass is being installed, the organic amendment should be decreased by half.

B. Organic Amendment: Shall be "Wondergrow" compost as available from Grover Landscape Services, Inc. (209) 545-4401. This source shall be submitted to the Owner for approval to the following: This source may fluctuate, therefore, if it does not meet the following specifications, Contractor shall submit amendment for approval.

Organic amendment- physical properties for 1/2 inch minus bark or shavings:

Percent Passing	Sieve Designation
90-100	12.70 mm
90-100	9.51 mm
75-100	6.35 mm
60-75	4.75 mm
20-60	2.38 mm
0-25	1.00 mm

Organic content: Minimum 25% based on dry weight and determined by ash method. Minimum 240 lbs organic matter per cubic yard of compost.

C. Onsite and Import Topsoil: A sample of the import topsoil shall be submitted for analysis 25 days prior to delivery. The soil shall be fertile and friable, free from refuse, debris, heavy clay, rocks, and noxious seeds. The soil shall meet the following characteristics:

Soil Chemistry Characteristics

Reaction- pH of saturated paste = 5.5 to 7.5
Salinity (Electrical conductivity in mmho/cm) = <4.0
Sodium Adsorption Ratio (SAR) = <6.0
Sodium = <5.0 milliequivalents per liter
Chloride = <5.0 milliequivalents per liter
Boron (Parts per Million in extract) = <1.0

Soil Fertility Characteristics

Adequate amounts of nitrogen, potassium, phosphorus, calcium, and magnesium should be available to support healthy plant growth. Deficiencies shall be mitigated with inorganic fertilizer amendments following importation.

Soil Physical Properties

Soil texture shall be a sandy loam or loam as evaluated by an USDA sieve analysis. Sand fraction of sandy loam soil shall be properly distributed so that soil is not subject to compaction. Minimum organic content shall be minimum 2% and maximum 5% based on dry weight and determined by ash method of analysis.

Required Particle Size Distribution (sandy loam):

Medium sand:	5-10%
Fine sand:	80-85%
Silt and Clay:	<7%

D. Onsite and Import Soil for Bio-Retention Plantings: A sample of the import topsoil shall be submitted for analysis 25 days prior to delivery. The soil shall be fertile and friable, free from refuse, debris, heavy clay, rocks, and noxious seeds. The soil shall meet the following characteristics:

Bio-Retention Soil Media Composition:

Fine Sand:	60-70%
Compost:	30-40%

Performance and Material Requirements:

Sand shall be clean construction sand, free of organic or deleterious materials, and meet standards ASTM C-33 or AASHTO M-6.

Compost shall be high quality and tested to meet the following criteria

- Organic Content: 35%-75% by dry weight.
- Maturity and Stability: Demonstrated to ensure it is not toic to plants.
- Carbon to Nitrogen Ratio: Between 15:1 and 25:1.
- Salinity: Less than 6.0 mmhos/cm.
- pH: Between 6.2 and 8.2

Infiltration rate shall be a minimum of 5 inches per hour.

PART 3 EXECUTION

3.01 LIMITS AND GRADES

A. Prior to commencing soil preparation operations, Contractor shall request a review by the Construction Manager to verify specified limits and grades of work completed to date and soil preparation work to commence. Contractor shall

complete the rough grading as necessary to round the top and toe of all slopes, providing naturalized contouring to integrate newly graded areas with the natural topography. Finish grading under this section shall be completed in accordance with the grades indicated on the landscape drawings.

3.02 TOPSOIL SUBGRADE SCARIFICATION

A. Prior to placing import, onsite or stockpiled topsoil and after rough grading operations to construct the finish subgrade at all planting areas, finish subgrade surface shall be ripped twice in opposite directions to a depth of 12” below finish subgrade. Finish subgrade is the top surface of the soil prior to placement of topsoil. Upon completion of scarification, compact subgrade to 85% relative density. Where onsite topsoil is scheduled to remain in place, soil shall be ripped twice in opposite directions to a depth of 12” below finish grade. Compact topsoil to 85% relative density.

3.03 TOPSOIL INSTALLATION

A. All proposed planting areas on plan shall contain a minimum of six (6) inches of acceptable topsoil. Exception: mulch-only areas where designated on the plans will not receive additional topsoil.

B. Subgrade soil shall be cut or filled to the depth required such that after placement of required amount of topsoil and specified preparation procedures have been accomplished, specified finish grades will be attained.

3.04 ORGANIC AMENDMENT AND FERTILIZER INCORPORATION

The following recommendation for topsoil is for bidding purposes only.

A. Shall be determined from soil analysis results. For bidding purposes only assume the specified materials shall be uniformly distributed throughout all planting areas and incorporated to a homogeneously blended soil depth of six inches, unless otherwise noted on plan or recommended in soil report. Exception: mulch-only areas where designated on the plans will not receive amendments or conditioners.

3.05 PLANT PITS

A. Plant pits shall have their sides and bottoms loosened or otherwise broken to prevent glazed or compacted surfaces, and shall be as shown on the planting detail and per the soils report.

3.06 BACKFILL

A. Excavate planting pits at least twice as wide as the diameter of the rootball.

B. Soil immediately below the root ball should be left undisturbed to provide support but the sides and the bottom around the side should be cultivated to improve porosity.

C. The top of the rootball should be at or slightly above final grade.

D. The top 12 inches of backfill around the sides of the rootball of trees and shrubs may consist of the above amended soil or may be prepared as follows:

4 parts	Site Soil
1 part	Composted Greenwaste Organic Amendment*

Uniformly blended with:

Amount per Cubic Yard of Backfill **Conventional**	
1/3 pound	Ammonium Sulfate (21-0-0)
1/8 pound	Triple Superphosphate (0-45-0)*
2 pounds	Gypsum (Calcium Sulfate)

OR

Amount per Cubic Yard of Backfill **Organic**	
1/3 pound	Blood Meal (12-0-0)
3/4 pound	Feather Meal (12-0-0)
1/4 pound	Steamed Bone Meal (3-15-0)*
2 pounds	Gypsum (Calcium Sulfate)

Backfill below 12 inches required for 24 inch box or larger materials should not contain the organic amendment, blood meal, feather meal or ammonium sulfate but should still contain the triple superphosphate or steamed bone meal and gypsum at the recommended rate.

E. Backfill below 12 inches required for 24 inch box or larger materials should not contain the organic amendment, blood meal, feather meal or ammonium sulfate but should still contain the triple superphosphate or steamed bone meal and gypsum at the recommended rate.

F. Ideally a weed and turf free zone should be maintained just beyond the diameter of the planting hole. A 2-4 inch deep layer of coarse mulch can be placed around the tree or shrub. Mulch should be kept a minimum 6 inches from the trunk.

G. Irrigation of new plantings should take into consideration the differing texture of the rootball substrate and surrounding soil matrix to maintain adequate moisture during this critical period of establishment.

3.07 PLANT TABLETS

A. All container plants shall receive plant tablets as follows:

One-gallon plants	two 21-gram tablets
Five-gallon plants	five 21-gram tablets
Fifteen-gallon plants	twelve 21-gram tablets
24-inch box trees	eighteen 21-gram tablets
36-inch box trees	twenty-three 21-gram tablets

Space the tablets evenly around the root ball halfway up backfill touching side of root ball. Construction Manager may require excavation of plants selected at

random for conformance review.

3.08 FINISH GRADING

A. Contractor shall finish grade all new, renovated or excavated planting areas unless otherwise noted, and shall remove all rocks and clods over one cubic inch to a depth of one inch below finish grade. All areas shall be smooth and uniformly graded. The Contractor shall repair all erosion damage during the construction period.

B. Unless otherwise noted, all soil finish grades shall be one inch below finish grade of walks, boxes, pavements, and curbs.

END OF SECTION

SECTION 029340 - PLANTING

PART 1 GENERAL

1.01 DESCRIPTION

A. Furnish and install all appropriate work items: plantings, staking, mulch placement and related work thereto.

1.02 QUALITY CONTROL

A. Reviews: The Contractor shall specifically request the following reviews prior to progressing with the work:
   1. Finish grade
   2. Plant material approval
   3. Plant layout
   4. Substantial completion
   5. Final completion

1.03 QUALITY ASSURANCE

A. Reference Standards:
   1. Manufacturer's recommendations.
   2. "Sunset Western Garden Book," Lane Publishing Co., Menlo Park, California; current edition.
   3. "American Standards for Nursery Stock," American Association of Nurseryman, 230 Southern Building, Washington, D.C. 20005.

B. Qualifications:
   1. Experience: Assign a full-time employee to the job as foreman for the duration of the Contract who is certified landscape technician, certification through CLCA or minimum of four (4) years of experience in landscape installation and maintenance supervision, with experience or training in turf management, entomology, pest control, soils, fertilizers and plant identification.
   2. Labor Force: Provide a landscape installation and maintenance force thoroughly familiar with, and trained in, the work to be accomplished to perform the task in a competent, efficient manner acceptable to the Owner.

C. Requirements:
   1. Supervision: The foreman shall directly supervise the work force at all times and be present during the entire installation. Notify Owner's Representative of all changes in supervision.
   2. Identification: Provide proper identification at all times for landscape maintenance firm's vehicles and a labor force uniformly dressed in a manner satisfactory to Owner's Representative.

D. Plant Material Standards
   1. Quality and Size of Plants: Conform to the State of California Grading Code of Nursery Stock, No. 1 grade. Use only nursery-grown stock which is free from insect pests and diseases.

2. Comply with federal and state laws requiring inspection for plant diseases and infestations. Submit inspection certificates required by law with each shipment of plants, and deliver certificates to the Owner. Obtain clearance from the County Agricultural Commissioner as required by law, before planting plants delivered from outside the County in which planted.

E. Related work specified elsewhere:
1. Section 029110 - Landscape Soil Preparation
2. Section 029350 - Landscape Maintenance
3. Section 329200 - Turf and Grasses

1.04 SUBMITTALS

A. Submit cut-sheets or samples of all products to be used in conformance with applicable Division Two specifications, General Conditions and Special Provisions. At a minimum, submit information for the following items:
1. Plant Material: Within 21 calendar days of receiving the Notice to Proceed, Contractor shall submit notice to the Construction Manager certifying the quantity and species of plant material ordered, the nursery supplying the material, any plant material unavailable at the time, and proposed plant substitutions. No plants shall be ordered or delivered prior to written acceptance by the Construction Manager.
2. Mulch: Within 21 calendar days of receiving the Notice to Proceed, Contractor shall submit written certificates stating composition and origin of mulch to the Construction Manager. Contractor shall submit two 1-gallon samples with certificates.
3. Fertilizers and conditioners.
4. Herbicide: Herbicide: Submit a written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by Construction Manager.
5. Tree Stake or Guy, and tree ties.
6. Root Barrier.

B. Submit Certificates of Compliance/analytical data from approved laboratory for degree of compliance for the following:
1. Seed Mixes.
2. Organic amendment.
3. Quantity of soil amendment delivered to site and incorporated into soil preparation.

C. Delivery Receipts: Provide delivery receipts for quantities of organic soil amendments delivered to the site.

1.05 PROJECT/SITE CONDITIONS

A. Site Visit: At beginning of work, visit and walk the site with the Owner's Representative to clarify scope of work and understand existing project/site conditions.

1.06 WARRANTY AND REPLACEMENT, per General Conditions requirements.

A. Pre-Emergence Weed Killer: Warrant the work against weed growth for a period of four (4) months after application.

B. Warrant all plants and planting to be in a healthy, thriving condition until the end of the maintenance period, and deciduous trees beyond that time until active growth is evident.

C. Replace all dead plants and plants not in a vigorous condition immediately as directed by the Owner's Representative at Contractor's expense. Install replacement plants before the final acceptance at the size specified.

D. Warrant all plant material for a period of one year after final acceptance of the maintenance work against defects in the plant prior to installation.

E. Warrant plant installation and maintenance by Contractor against defects for a period of one year.

PART 2 PRODUCTS

2.01 MATERIALS

A. Nomenclature and Labels: Plant botanical names shall conform to "Standardized Plant Names", second edition, and secondly, "A Checklist of Woody Ornamental Plants of California", Manual 32, University of California. All plants of each clone, species, and cultivar shall be delivered to the site labeled with their full botanical names. Every plant species shall be labeled with no less than one label for every ten plants of a species.

B. Quality: Minimum quality of all plant material shall conform to prevailing published specifications of the California Association of Nurserymen and the American Association of Nurserymen 'American Standard for Nursery Stock' unless otherwise indicated. Additional specifications shall be indicated on the drawings.

C. Quantities: the quantities shown on the plant list and in labels are for the Construction Manager’s use and are not to be construed as the complete and accurate limits of the contract. Contractor shall furnish and install all plants shown schematically on the drawings. Any unlabelled plants shall be considered as the smaller size shown for that type on the drawings.

D. Root Systems: All container-grown stock shall be grown in its container for at least six months prior to its planting. Contractor shall allow one percent of the quantity of plants for removal and inspection. Any plant material, within one year following the final acceptance of the project, determined by the Construction Manager to be defective, restricted, declining or otherwise deficient due to abnormal root growth, shall be replaced by Contractor, to the equal condition of adjacent plants, at the time of replacement.

E. Health: Foliage roots and stems of all plants shall be of vigorous health and normal habit of growth for its species. All plants shall be free of all diseases, insect stages, burns, or disfiguring characteristics.

F. Untrue Species: All plant material, within two years following the final acceptance of the project, determined by the Construction Manager to be untrue to the species, clone, and/or variety specified, shall be replaced by the Contractor, to the equal condition of adjacent plants at the time of replacement.

G. Herbicide: Shall be a commercially available pre-emergent herbicide material recommended for this project and these plantings by a State of California appropriately licensed individual. Herbicides shall be registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted herbicides unless authorized in writing by authorities having jurisdiction. The licensed individual shall review all planting, including, the types and extent of soil preparation, the irrigation systems, drainage patterns, and other project characteristics to verify type, compatibility, and recommend the appropriate herbicide(s) for use. Contractor shall be responsible for all overspray, spreading, runoff, plant health, and other impacts from the use of the herbicide.
   1. When using pesticides and herbicides on school property, the contractor shall post 72 hours prior and leave posting up for 72 hours after. Contractor shall not spray if it is windy. If the herbicide product is not currently on Merced School District's website or in their binders and files, the contractor shall get product approval from Merced School District's Risk Management team before applying the herbicide.

H. Mulch: Shall be shredded redwood bark containing no preservatives or dyes of any kind.

I. Root Barrier: Shall be as indicated on the drawings.

J. Tree Stake or Guy: Refer to Part 3 of this Section.

2.02 GRASSES

A. Turf Seed: Refer to plans.

B. Molate Red Fescue: Refer to the plans.

PART 3 EXECUTION

3.01 GENERAL

A. Plant Material Approvals: Before planting operations commence, all or a representative sampling of plant material shall be reviewed at the site by the Construction Manager. Defective plants installed without such review shall be removed from the site upon request by the Construction Manager and an acceptable plant substituted in its place.

B. Layout: Only those plants to be planted in any single day shall be laid out. Locations of all plants shall be reviewed prior to planting. Plants installed without this review shall be transplanted as directed by the Construction Manager.

C. Protection of Plants: Contractor shall maintain all plant material in a healthy growing condition prior to and during planting operations. Contractor shall be responsible for vandalism, theft and damage to plant material until the commencement of the maintenance period.

D. Root Systems: Contractor shall be responsible for inspection of all root systems on plant materials. Inspection shall include, but not be limited to, checking for rootbound stock, encircling roots at the perimeter of the container, girdling roots at the top surface of the rootball, and other defective root conditions. Such inspections shall include the complete removal of soil from one percent of plant material containers, or at least one plant from each nursery and each plant type. Contractor shall cut defective or potentially defective girdling, rootbound, and encircling roots and spread the root system into the surrounding backfill. The Contractor shall reject plants with excessively defective root systems.

E. Pruning: Contractor shall do no pruning without the specific approval of the Construction Manager. Plants pruned without approval shall be replaced by the Contractor, if required. Refer to notes on plan.

F. Basins: Construct basins as indicated on the drawings. Basin bottoms shall be constructed to drain away from plant stem.

G. Plant Pits, Backfill and Finish Grading: See SOIL PREPARATION Section for materials and installation requirements.

H. Cleanup: After completion of all operations, Contractor shall remove all trash, excess soil and other debris. All walks and pavement shall be swept and washed clean, leaving the entire area in a neat, orderly condition.

I. Mulch: Mulch all tree, shrub and ground cover planting areas or where designated on the plans with organic mulch to a 3-inch depth, except adjacent to pavement where soil grade is 1 inch below top of pavement, mulch shall be 1 inch deep for a horizontal length of 3 feet maximum. Hold bark mulch away from base (trunk) of plant 6 inches or as directed by the Owner's Representative. No mulch is required around trees in turf areas.

J. Tree Staking: All trees shall be provided with Lodge Pole Pine Stakes, pressure treated with Chemonite (See Plans for Tree Planting Detail). Tree stakes shall not be driven into the rootball.
   1. 15-gallon trees or smaller: 2" diameter x 10' long stake. Cut top as required per the drawings.
   2. 24-inch box trees or larger: 3" diameter x 12' long stake. Cut top as required per the drawings.
   3. The tree ties shall be pieces of corded rubber placed just below the main fork or branches and as per the drawings.
   4. Stakes shall be driven securely into existing soil aligned with the trunk and perpendicular to the direction of the prevailing winds.

5. See Plans for quantity of tree stakes per tree.

3.02 TREE AND SHRUB PLANTING

A. Mark tree and shrub locations on site using stakes, gypsum or similar approved means and secure location approval by the Landscape Architect before plant holes are dug. Adjust location as necessary prior to planting.

B. Test drainage of plant beds and pits by filling with water (minimum 6"). The retention of water in planting beds and plant pits for more than two (2) hours shall be brought to the attention of the Landscape Architect. If rock, underground construction work, tree roots, poor drainage, or other obstructions are encountered in the excavation of plant pits, alternate locations may be selected by Landscape Architect.

C. Excavate tree, shrub and vine pits per the drawings.

D. Break and loosen the sides and bottom of the pit to ensure root penetration and water test hole for drainage as required above.

E. Backfill plant holes with mix as specified, free from rocks, clods or lumpy material. Backfill native soil free of soil amendments under rootball and foot tamp to prevent settlement. Backfill remainder of the hole with soil mix and place plant tablets per Section 029110

F. Carefully remove and set plants without damaging the rootball. Superficially cut edge roots vertically on three sides. Remove bottom of plant boxes before planting. Remove sides of boxes after positioning the plant and partially backfilling.

G. Set plants in backfill with top of the rootball 2 inches above finished grade. Backfill remainder of hole and soak thoroughly by jetting with a hose and pipe section. Water backfill until saturated the full depth of the hole.

H. Build 4" high watering basin berms around trees and shrubs to drain through rootball. Basins are not required around trees in turf areas.

I. Stake and/or guy trees as detailed.

J. Remove any soil from top of plant rootballs and secure Owner’s Representative's approval of rootball height prior to mulching.

K. After approval of rootball height, install as required.

3.03 WATERING: Water all trees, shrubs and ground cover immediately after planting. Apply water to all plants as often and in sufficient amount as conditions may require to keep the plants in a healthy vigorous growing condition until completion of the Contract. Do supplemental hand watering of trees and shrubs during the first 3 weeks of plant establishment.

END OF SECTION

SECTION 029350 - LANDSCAPE MAINTENANCE

PART 1 GENERAL

1.01 DESCRIPTION

A. Work in this section includes the growing and maintenance operations necessary to establish all trees, shrubs, groundcover, turf, grasses and other plantings; to provide pest and disease control, and to maintain the irrigation system, and related construction elements.

1.02 QUALITY ASSURANCE

A. Related work specified elsewhere:
1. Section 028100 – Irrigation
2. Section 029110 – Landscape Soil Preparation
3. Section 029340 – Planting
4. Section 329200 – Turf and Grasses

1.03 QUALITY ASSURANCE

A. Related work specified elsewhere:

1.04 SUBMITTALS

A. Submit cut-sheets or samples of all products to be used in conformance with applicable Division Two specifications, General Conditions and Special Provisions. At a minimum, submit information for the following items:
1. Soil Testing: Contractor shall collect one one-quart sample in the planting area of the in-place topsoil 20 calendar days after completion of planting and submit to Lucchesi Plant & Soil Consulting, LLC, info@lucchesiconsulting.com, (408) 337-2575, for maintenance period fertilizer recommendation. Test results shall be made available to the Construction Manager. Sample shall be a representative composite taken from several planting areas. Cost of soil test shall be paid for by the Contractor.
2. Herbicide: Submit a written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by Construction Manager.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fertilizer: Used during the course of the maintenance period shall be determined by soils test required under Part 1 of this Section. For bidding purposes only, assume the use of ammonium sulfate (12-0-0) at 8 lbs. per 1000 SF, and applied in 45 day intervals.

B. Water: During the course of construction and maintenance period, water shall

be paid for by the Owner.

C. Herbicide: Shall be a commercially available pre-emergent herbicide material recommended for this project and these plantings by a State of California appropriately licensed individual. Herbicides shall be registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted herbicides unless authorized in writing by authorities having jurisdiction. The licensed individual shall review all planting, including, the types and extent of soil preparation, the irrigation systems, drainage patterns, and other project characteristics to verify type, compatibility, and recommend the appropriate herbicide(s) for use. Contractor shall be responsible for all overspray, spreading, runoff, plant health, and other impacts from the use of the herbicide.

1. When using pesticides and herbicides on school property, the contractor shall post 72 hours prior and leave posting up for 72 hours after. Contractor shall not spray if it is windy. If the herbicide product is not currently on Merced School District's website or in their binders and files, the contractor shall get product approval from Merced School District's Risk Management team before applying the herbicide.

PART 3 EXECUTION

3.01 TIME LIMITS**:** The maintenance period shall commence from the date of substantial completion of planting as defined in paragraph 3.06 below, and extend for a 90-calendar day period thereafter, or until the acceptance of Final Completion.

3.02 FERTILIZER APPLICATION**:** Fertilizer(s) shall be applied per the soil laboratory's recommendations. For bidding purposes, assume initial application to be four weeks after planting and subsequent applications to be at 45-day intervals.

3.03 HERBICIDE APPLICATION**:** Herbicide shall not be used until all plant material has been planted a minimum of 20 calendar days. All planting areas shall be kept weed-free by non-herbicide methods during this time period. Herbicide shall not be applied to any areas which are or have been seeded. Contractor must apply the material in conformance with the written recommendations of the State appropriately licensed individual.

3.04 BASIC REQUIREMENTS: All planting areas shall be kept weed-free at all times during the maintenance period. All pest and disease control shall be the Contractor's responsibility. All planting areas shall be kept at optimum moisture for plant growth. Settlement of soil and plants and soil erosion shall be repaired and areas replanted as required. Dying or deficient plants shall be replaced as soon as they become apparent.

3.05 OWNER'S RESPONSIBILITY**:** Work installed under this contract that is damaged or stolen prior to Substantial Completion shall be repaired or replaced by the Contractor without cost to the Owner. After Substantial Completion and through the maintenance period, these damages and similar factors such as extensive litter, abuse and defacement shall be the Owner's responsibility to repair or replace and shall not be a part of this contract. No planting shall be guaranteed beyond the maintenance period, except as to conformance to specified species and variety, and except as to conditions specified under

"Root Systems" of Planting, Section 029340.

3.06 SUBSTANTIAL COMPLETION**:** Shall be deemed as the time all major plantings, including trees, are installed, and when all other work is satisfactorily completed (with the exception of minor items to be completed as noted upon a checklist compiled by the Construction Manager). Maintenance period shall not commence until work is deemed substantially complete by the Construction Manager. All planting must be complete, including seeding, before maintenance may begin.

A. General Requirements:
1. A longer period may be required if the turf is not thick, vigorous and even and has been mowed a minimum of 4 times, or if the plant material is not acceptably maintained during the maintenance period. The maintenance period may be suspended at any time upon written notice to the Contractor that the landscaping is not being acceptably maintained, and the day count suspended until the landscape is brought up to acceptable standards as determined by the Landscape Architect.
2. Planting establishment maintenance immediately follows, coincides with, and is continuous with the planting operations, and continues through turf installation, and after all planting is complete and accepted; or longer where necessary to establish acceptable stands of thriving plants.
3. Protect all areas against damage, including erosion, trespass, insects, rodents, disease, etc. and provide proper safeguards. Maintain and keep all temporary barriers erected to prevent trespass.
4. Keep all walks and paved areas clean. Keep the site clear of debris resulting from landscape work or maintenance.
5. Repair all damaged planted areas, and replace plants and reseed or resod turf immediately upon discovery of damage or loss.
6. Check sprinkler systems at each watering; adjust coverage and clean heads immediately. Adjust timing of sprinkler controller to prevent flooding.
7. Maintain adequate moisture depth in soil to ensure vigorous growth. Check rootball of trees and shrubs independent of surrounding soils and hand water as required.
8. Keep Contract areas free from weeds by cultivating, hoeing or hand pulling. Use of chemical weed killers will not relieve the Contractor of the responsibility of keeping areas free of weeds over 1-inch high at all times.

B. Tree, Shrub and Ground Cover Maintenance:
1. Maintain during the entire establishment period by regular watering, cultivating, weeding, repair of stakes and ties, and spraying for insect pests. Prune when requested by the Landscape Architect or Owner’s Representative.
2. Keep watering basins in good condition and weed-free at all times.
3. Replace all damaged, unhealthy or dead trees, shrubs, vines and ground covers with new stock immediately; size as indicated on the drawings.
4.

C. Turf:

1. Maintain during the entire establishment period. Cut as frequently as growth of grass requires. Cut to a height of two inches (2"), unless otherwise directed by the Landscape Architect.
2. Maintain constant moisture to a depth of eight inches (8").
3. Trim edges of turf at paving and headerboards at time of second cutting, and at each later cutting.
4. Keep a 2-foot diameter area at tree trunk free of turf at all times to serve as a mowing band. Do not create low area around base of tree.
5. Keep turf areas free of undesirable weeds and grasses by the application of suitable selective weed killers or hand pulling.
6. Reseed all damaged areas as soon as evident.
7. Repair any hollow, settled or eroded areas by filling, rolling and reseeding.

D. Fertilizing:

1. Upon approval and after submitting fertilizer delivery tags, fertilize all turf areas, new sod should receive a light fertilization 2 weeks after planting with 8-3-5 applied at a rate of 8 pounds per 1000 square feet. For turf from seed this application should be after the first mowing. The area may then be maintained with primarily a nitrogen program of applying 8 pounds of Blood Meal (12-0-0) per 1000 square feet. Treatment should be at 45 to 60 day intervals until the turf becomes well established. Once the turf is well established, the frequency of fertilization should be decreased depending on color and rate of growth desired. In the spring and fall substitute a complete fertilizer such as 5-5-5 to help ensure continuing adequate phosphorus and potassium.
2. Maintenance fertilization for other areas should rely primarily on a nitrogen only program supplemented with a complete fertilizer in the fall and spring. Beginning 45-60 days after planting, ammonium sulfate (21-0-0) should be applied at a rate of 5 pounds per 1000 square feet with reapplication every 45-60 days. Alternatively, slow release Sulfur-coated Urea (43-0-0) may be applied at 6 pounds per 1000 square feet every 90 days. Once plants are performing satisfactorily, the frequency of fertilization may be decreased depending on color and rate of growth desired. In the winter for a quick greening effect, calcium nitrate (15.5-0-0) may be applied at a 6 pound rate if applicable. Early fall and spring, substitute a complete fertilizer such as 15-15-15 to help ensure continuing adequate phosphorus and potassium.
3. If organic maintenance recommendations are preferred, Blood Meal (12-0-0) provides available nitrogen fairly rapidly while materials such as Feather Meal (12-0-0), Soybean or Cotton Seed Meal (7-1-1) are slower to provide available nitrogen, but they extend the length of time they make this contribution. In order to provide a good supply of nitrogen for a 3-4 month time frame a good combination would be 6 pounds Blood Meal and 14 pounds Feather Meal per 1000 square feet. In the fall and spring, substitute a complete organic fertilizer such as 5-5-5 applied at the manufacturer's label rate. Or, nutrient rich composted greenwaste may be spread on a 1 to 2 inch layer, which generally carries enough nutrition to boost complete nutrition though a source of

nitrogen might also be added at a half rate to ensure adequate nitrogen availability.

4. Observe plant's color, and if a soil pH imbalance is suspected, take soil samples and obtain laboratory analysis for confirmation. Take necessary action recommended in laboratory analysis such as top dressing with soil sulfur, leaching soil, etc.

3.07 FINAL PLANTING REVIEW AND ACCEPTANCE, PER GENERAL CONDITIONS REQUIREMENTS

A. At the conclusion of the planting establishment period, schedule a final review with the Owner, the Owner's maintenance person, and the Landscape Architect. Notify all attendees at least five working days in advance of the proposed review date. On such date, all project improvements and all corrective work shall have been completed. If all project improvements and corrective work are not completed, continue the planting establishment, at no additional cost to the Owner, until all work has been completed. This condition will be waived by the Owner under such circumstances wherein the Owner has granted an extension of time to permit the completion of a particular portion of the work beyond the time of completion set forth in the Agreement.

C. Prior to review, weed and rake all planted areas, repair plant basins, mow and edge turf, plumb tree stakes, clear the site of all debris and present in a neat, orderly manner.

END OF SECTION

SECTION 03 20 00 –CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. Work under this Section includes the furnishing and installing of all steel reinforcing for cast-in-place concrete, complete, with all related items, accessories and incidentals required, such as ties, spacing devices inserts and all other material required to complete installation.

1.02 APPLICABLE STANDARDS (LATEST EDITIONS APPLY)

A. ACI- American Concrete Institute:

1. 301, Specifications for Structural Concrete for Buildings.

2. 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures.

3. 318, Building Code Requirements for Reinforced Concrete.

B. ASTM- American Society for Testing and Materials, Referenced Standards

C. AWS- American Welding Society:

1. D1.4 Structural Welding Code- Reinforcing Steel

2. A5.1 Mild Steel Covered Arc-Welding Electrodes

D. CRSI- Concrete Reinforcing Steel Institute:

1. Manual of Standard Practice

2. Recommended Practice for Placing Reinforcing Bars

E. ICC- International Code Council:

1. CBC 2022, California Building Code (California Code of Regulations, Title 24, Part 2)

1.03 SUBMITTALS

A. Shop Drawings of all reinforcing steel shall be submitted for approval.

B. Mill Reports for each different heat to be used on the job shall be submitted for approval. Comply with CBC, Section 1910A.2 and ACI 318 Section 26.6.

1.04 QUALITY ASSURANCE

A. Welders shall be qualified in accordance with AWS D1.4.

PART 2 PRODUCTS

2.01 MATERIALS

A. Reinforcing bars: Deformed, new billet-steel bars conforming to ASTM Designation A615, Grade 60 (minimum tensile strength: 80ksi) or ASTM A706 unless noted otherwise.

B. Reinforcing mesh: Welded wire fabric conforming to ASTM A1064.

C. Tie wires and spirals: ASTM A1064.

D. Reinforcement supports

1. At reinforcing placed over sand or earth, use precast concrete cubes.

2. At reinforcing placed over forms, provide supports with legs which are hot dip galvanized, stainless steel or plastic protected.

E. Mechanical Bar Splice: Xtender by Headed Reinforcement Corp. (ICC ESR-2764) or equal to develop a minimum of 125% of yield strength of bar.

2.02 FABRICATION:

A. Except where specified otherwise herein or shown otherwise on the plans, reinforcing steel shall be cleaned, fabricated, placed, tied and supported in accordance with ACI 301 and ACI 315.

PART 3 EXECUTION

3.01 INSTALLATION

A. Reinforcing bars shall be accurately placed and shall be supported and secured against displacement by the use of adequate and proper supporting and spacing devices, tie wire, etc., so that it will remain in its correct location in the finished work. No supporting devices shall be used that will impede the flow of concrete.

B. Do not bend or straighten reinforcing in any manner that will injure the material.

C. Install splices for reinforcing bars in accordance with drawings and ACI 318. Stagger splices in adjacent bars 5’ – 0".

D. Reinforcing mesh shall be laid flat in place. Lap mesh at sides and ends 12 inches. Wire mesh together at 24 inches on center.

3.02 CLEARANCES

A. Where not shown otherwise on the drawings, the minimum concrete coverage for steel reinforcement shall be as follows:

1. Where concrete is deposited against ground 3”

2. Concrete in forms exposed to earth or weather 2”

B. The clear spacing between parallel bars shall be not less than 1-1/2 times the normal diameter of the maximum size aggregate, and in no case less than 1-1/2 inches, except at splices which may be wired together.

3.03 WELDING: Perform all welding in accordance with AWS D1.4.

3.04 FIELD QUALITY CONTROL

A. Contractor shall examine placement of all reinforcement and embedded items prior to inspection by Owner’s Testing Agency to ensure the proper clearances have been maintained and that all reinforcement and inserts are firmly tied to resist displacement.

B. The Inspector of Record will inspect

1. In-place reinforcing steel

C. Qualified Welding Inspector

1. Field welding of reinforcing steel shall be inspected by a qualified welding inspector in compliance with CBC §1705A.3.1 and §1705A.2.5.

3.05 NOTIFICATION: Notify the Architect and the Division of the State Architect two working days in advance of concrete placement.

END OF SECTION

SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. Work under this Section includes the furnishings and installing of all concrete work, complete, with all related accessories, items and incidentals required.

B. Coordinate installation of all inserts and embedded items required or indicated.

1.02 APPLICABLE STANDARDS (LATEST EDITIONS APPLY)

A. ACI- American Concrete Institute:

1. 301, Specifications for Structural Concrete for Buildings.

2. 305, Recommended Practice for Cold Weather Concreting.

3. 306, Recommended Practice for Hot Weather Concreting.

4. 318, Building Code Requirements for Reinforced Concrete.

B. ASTM- American Society of Testing and Materials, Referenced Standards.

C. ICC- International Code Council:

1. CBC 2022, California Building Code (California Code of Regulations, Title 24, Part 2)

1.03 SUBMITTALS

A. Mix Design and Tests:

1. Submit cement supplier’s certification of cementitious materials, mix designs and compressive strength test reports from previous applications for specified types of concrete.

2. One copy of all test reports shall be forwarded to DSA, the Architect, the Structural Engineer, the Inspector of Record within fourteen days of the test. Test reports shall comply with all requirements of CCR Title 24, Part 1, Section 4-335.

3. The concrete mixes shall be based on designs of a professional testing laboratory, verified by test, also in accordance with ACI 318, Section 26.12 and CBC section 1905A.1.17

PART 2 PRODUCTS

2.01 MATERIALS

A. General: Materials for cast-in-place concrete shall be set as forth in ACI 301 except as modified herein and as otherwise indicated in project documents.

B. Portland Cement: ASTM C150 Type II modified, with maximum alkali content of 0.6 percent (from only one source). Comply with Title 24, Section 1903A and ACI 318 Section 26.4. Cement to be certified per Title 24, Section 1910A.1.

C. Aggregates: ASTM C33, (from source as approved by the Testing Agency). Comply with Title 24, Sections 1903A, 1905A and ACI 318 Section 26.4

D. Water: clean, potable, free of injurious materials.

E. Admixtures: Only brand products documented to have had not less than five years of satisfactory performance shall be used. Admixtures containing chlorides shall not be used. Comply with Title 24, Sections 1903A, 1905A and ACI 318 Section 26.4

1. Air Entraining: ASTM C260

F. Grout: Manufactured pre-mixed. Non-ferrous, non-staining, flowable grout which will not shrink as it cures, 5000 psi @ 7 days.

G. Fly Ash: The amount of fly ash shall conform to the requirements of ACI 318 Sections 26.4.1.1 and 26.4.2.2.

2.02 CONCRETE MIX

A. Ready-Mix Concrete: ASTM C94.

2.03 PROPORTION AND MIXTURE

A. Proportioning mixtures and production of concrete shall be in accordance with ACI 318, Section 26.4 and CBC section 1905A and shall be in accordance with mix designs submitted by concrete supplier and approved by the Owner's Testing Agency. All concrete shall have at least 5 sacks of cement per cubic yard of mix.

B. Concrete shall have 3% +/- 1%, air entrainment when approved by Testing Agency.

C. Water reducing admixtures may be used in concrete when approved by Testing Agency. Such admixtures shall not interfere with or reduce required air content dosage of air-entrained concrete.

D. Use a minimum of 5 sacks of cement per cubic yard for all concrete.

E. Concrete Mix Requirements: The following table presents a schedule of elements of concrete, compressive strength in psi after 28-days when tested in accordance with ASTM C39, maximum aggregate and maximum slump, which shall be as follows:

Concrete Element	***Strength***	***Max. Size Aggregate (Inch)***	***Max. Slump (Inch)***
All Concrete	per drawings	per drawings	per drawings

PART 3 EXECUTION

3.01 INSPECTION

A. Areas in which concrete is to be placed shall be inspected by Contractor for defects which would prohibit satisfactory placement of concrete or related miscellaneous items. Such defects shall be corrected prior to commencement of work.

B. Concrete shall not be deposited or placed until all forms, reinforcing steel and construction joints have been inspected by Owner's Testing Agency and accepted in advance within the entire extent of the pour. Architect shall be notified 48 hours prior to first pour.

3.02 FIELD QUALITY CONTROL

A. The Owner's Testing Agency will:

1. Review concrete mix designs.

2. Perform testing in accordance with ACI 318 Section 26.12 and CBC Sections: 1903A and 1905A and 1910A.

3. Continuously monitor concrete temperature and inspect concrete placement.

4. Test concrete to control slumps according to ATSM C31 and ASTM C172.

5. Test concrete for required compressive strength in accordance with ACI 318, Section 26.12 and CBC Section 1905A and 1910A.

   a. Make and cure three specimen cylinders according to ATSM C31 for each 50 cubic yards per ACI 318, Section 26.12 and CBC section 1905A, or fraction thereof, of each class poured at site each day.

   b. Retain one cylinder for 7-day test and two for the 28-day test.

c. Number each cylinder 1A, 1B, 1C, 2A, 2B, 2C, etc; date each set; and keep accurate record of pour each set represents.

d. Transport specimen cylinders from job to laboratory after cylinders have cured for 24-hours on site. Cylinders shall be covered and kept at air temperatures between 60 and 80 degrees Fahrenheit.

e. Test specimen cylinders at age 7-days and age 28-days for specified strength according to ASTM C39.

f. Base strength value on average of two cylinders taken for 28-day test.

B. The Contractor shall:

1. Submit ticket for each batch of concrete delivered to job site. Ticket shall bear the following information:

a. Design mix number.

b. Signature or initials of ready mix representative.

C. Comply with Title 24, ACI 318, Section 26.12 and CBC Section 1905A

3.03 WORKMANSHIP

A. All concrete shall be placed, finished and cured, and all other pertinent construction practices shall be in accordance with the Specifications for Structural Concrete for Buildings (ACI 301) hereby made a part of these specifications.

B. In addition to the requirements of ACI 301, the following shall prevail:

1. Concrete shall be placed so that a uniform appearance of surface will be obtained.

2. The concrete shall be free of all rock pockets, honeycombs and voids.

3. Concrete shall be deposited as nearly as practical in its final position.

4. The sub-grade shall be slightly moist when the concrete is placed for floor slabs to prevent excessive loss of water from the concrete mix.

5. Place concrete within 90 minutes of mixing.

C. Vibrators and Vibrating:

1. Employ as many vibrators and tampers as necessary to secure the desired results. Minimum: one per each 20 cubic yards of concrete placed per hour.

2. Eliminate the following applications:

    a. Pushing of concrete with vibrator.

    b. External vibration of forms.

    c. Allowing vibrator to vibrate against reinforcing steel where steel projects into green concrete.

    d. Allowing vibrator to vibrate contact faces of forms.

3. Vibrators shall function at a minimum frequency of 3600 cycles per minute when submerged in concrete.

4. Supplement vibration by forking and spading along the surfaces of the forms and between reinforcing whenever flow is restricted.

D. Curing:

1. General: Freshly deposited concrete shall be protected from premature drying and excessively hot or cold temperatures and shall be maintained with minimal moisture loss at a relatively constant temperature for the period of time necessary for the hydration of the cement and proper hardening of the concrete. Also comply with ACI 318, Section 26.12 and CBC Section 1905A.

2. Initial Curing: Initial curing shall immediately follow the finishing operation. Concrete shall be kept continuously moist at least over night. One of the following materials or methods shall be used:

    a. Ponding or continuous sprinkling.

    b. Absorptive mat or fabric kept continuously wet.

3. Final Curing: Immediately following the initial curing and before the concrete has dried, additional curing shall be accomplished by one of the following materials or methods:

    a. Continuing the method used in initial curing.

    b. Slabs to receive finish flooring materials to be continuously wet cured for 7 days.

    c. Waterproof paper conforming to “Specifications for Waterproof Paper for Curing Concrete” (ASTM C171).

    d. Curing compounds conforming to “Specifications for Liquid Membrane-Forming Compounds for Curing Concrete” (ASTM C309). Such compounds shall be applied in accordance with the

recommendations of the manufacturer and shall not be used on any surfaces against which additional concrete or other cementitious finishing materials (such as ceramic tile) are to be bonded, nor on surfaces on which such curing is prohibited by the project specifications.

e. Other moisture-retaining coverings as approved.

4. Duration of Curing: The final curing continue until the cumulative number of days or fractions thereof, not necessarily consecutive, during which temperature of the air in contact with the concrete is above 50 degrees F., has totaled 7 days.

5. Formed Surfaces: Steel forms heated by the sun and all wood forms in contact with the concrete during the final curing period shall be kept wet. If forms are to be removed during the curing period, one of the above curing materials or methods shall be employed immediately. Such curing shall be continued for the remainder of the curing period.

E. Construction Joints

1. Joints not shown on the drawing shall be so made and located as to least impair the strength of the structural element and shall be approved by the Owner and Structural Engineer.

2. The surfaces of all concrete at all joints shall be thoroughly cleaned and all laitance removed by sandblasting.

3. Concrete surfaces at designated joints shall be roughened to ¼" relief with roto hammer or similar method.

4. Moisten all joints immediately prior to placement of concrete.

F. Embedded Items:

1. All sleeves, inserts, anchors and embedded items required for adjoining work or for its support shall be placed prior to concreting. Embedded items shall be positioned accurately and supported against displacement. Voids in sleeves, inserts and anchor bolt slots shall be filled temporarily with a readily removable material to prevent entry of concrete into the voids.

G. Grouting Column Bases:

1. The grout shall be mixed and placed in strict accordance with manufacturer's instructions.

2. Care shall be taken in the grouting to ensure that there is full bearing between the base plates and the grout.

3.04 DEFECTIVE WORK: WORK CONSIDERED TO BE DEFECTIVE MAY BE ORDERED TO BE REPLACED, IN WHICH CASE THE CONTRACTOR SHALL REMOVE THE DEFECTIVE WORK AT HIS EXPENSE. WORK CONSIDERED TO BE DEFECTIVE SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:

A. Concrete in which defective or inadequate reinforcing steel has been placed.

B. Concrete incorrectly formed, or not conforming to details and dimensions on the drawings or with the intent of these documents, or concrete the surfaces of which are out of plumb or level.

C. Concrete below specified strength.

D. Concrete containing wood, cloth or other foreign matter, rock pockets, voids, honeycombs, cracks or cold joints not scheduled or indicated on the drawings.

3.05 CORRECTION OF DEFECTIVE WORK

1.01 The Contractor shall, at his expense, make all such corrections as directed by the engineer and approved by DSA.

2.01 Concrete work containing rock pockets, voids, honeycombs, cracks or cold joints not scheduled or indicated on the drawings shall be chipped out until all unconsolidated material is removed.

3.06 SLAB FINISH

A. Covered interior slabs shall receive a smooth, steel troweled finish. Tolerance shall be 1/8” in 10’-0”.

B. Slabs under ceramic tile shall receive a roughened finish.

C. Exposed interior & exterior slabs receive a medium broom finish as directed. Edges shall be smooth troweled. See drawings for specifics.

END OF SECTION

SECTION 087100 – GATE HARDWARE

PART 1 GENERAL

1.01 DESCRIPTION

A. This Section includes:

1. Mechanical gate hardware for the following:

a. Swinging pedestrian gates in decorative metal fencing system.

1.02 QUALITY ASSURANCE

A. Related Documents

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

B. References

1. Builders Hardware Manufacturers Association (BHMA):

a. BHMA A156.3: Exit Devices.

b. BHMA A156.6: Architectural Door Trim.

c. BHMA A156.16: Auxiliary Hardware.

d. BHMA A156.18: Materials and Finishes.

e. BHMA A156.28: Recommended Practices for Keying Systems.

2. Door and Hardware Institute (DHI):

a. DHI Handbook: Sequence and Format for the Hardware Schedule.

3. United States Department of Justice:

a. ADA Standards for Accessible Design, current edition.

C. Coordination

1. Installation Templates: Distribute door hardware templates for gates and other work specified to be factory prepared for installing gate hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing gate hardware to comply with indicated requirements.

D. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1. Installer shall have warehousing facilities in Project's vicinity.

2. Scheduling Responsibility: Preparation of door hardware and keying schedules.

E. Architectural Hardware Consultant Qualifications: A person who is currently certified by DHI as an Architectural Hardware Consultant and who is experienced in providing

consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.

F. Source Limitations: Obtain each type and variety of gate hardware from a single manufacturer.

G. Related work specified elsewhere includes:
1. Section 323119 – Decorative Metal Fences and Gates

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Gate Hardware Sets: Prepared by or under the supervision of Installer, detailing fabrication and assembly of gate hardware, as well as installation procedures and diagrams. Coordinate final gate hardware sets with gates, frames, and related work to ensure proper size, thickness, hand, function, and finish of gate hardware.
1. Submittal Sequence: Submit final gate hardware sets at earliest possible date, particularly where approval of gate hardware sets must precede fabrication of other work that is critical in Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by gate hardware, and other information essential to the coordinated review of the gate hardware sets.
2. Format: Comply with scheduling sequence and vertical format in DHI Handbook “Sequence and Format for the Hardware Schedule.” Double space entries, and number and date each page. .
3. Content: Include the following information:
a. Identification number, location, hand, fire rating, size, and material of each door and frame.
b. Location of each gate hardware set, cross-referenced to Drawings on plans.
c. Type, style, function, size, quantity, and finish of each gate hardware item.
d. Complete designations, including name and manufacturer, type, style, function, size, quantity, and finish of each gate hardware product.
e. Fastenings and other pertinent information.
f. Explanation of abbreviations, symbols, and codes contained in schedule.
g. Mounting locations for gate hardware.
h. List of related gate devices specified in other Sections for each gate.

C. Keying Schedule: Prepared by or under supervision of Installer, detailing Owner’s final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with Contract Documents.

1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for gate hardware on gates located in accessible routes.

C. Warranty: Special warranty specified in this Section.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of gate hardware to include in maintenance manuals. Include final hardware and keying schedule.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Inventory gate hardware on receipt and provide secure lock-up for gate hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with the final gate hardware sets, and include basic installation instructions, templates, and necessary fasteners with each item or package.

C. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.07 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of gate hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
    a. Structural failures including excessive deflection, cracking, or breakage.
    b. Faulty operation of gates and gate hardware.
    c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
2. Warranty Periods:
    a. Exit Devices: 3 years from date of Substantial Completion.

1.08 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of gate hardware.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Means of Egress Gates: Comply with California Building Code. Locks do not require use of a key, tool, or special knowledge for operation. Latches do not require more than 15 lbf to release the latch.

B. Accessibility Requirements:

1. Comply with applicable provisions of the following:
   a. California Building Code (Title 24, Part 2), Chapters 11A and 11B.
   b. United States Department of Justice's ADA Standards for Accessible Design, current edition.
2. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
3. Comply with the following maximum opening-force requirements:
   a. Exterior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.

2.02 SCHEDULED GATE HARDWARE

A. General: Provide gate hardware for each gate to comply with requirements in this Section and gate hardware sets indicated in Part 3 "Gate Hardware Sets" Article.

1. Gate Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturer's products.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of gate hardware are indicated in Part 3 "Gate Hardware Sets" Article. Products are identified by using Gate hardware designations, as follows:

1. Named Manufacturer's Products: Manufacturer and product designation are listed for each gate hardware type required. Manufacturer's names are abbreviated in Part 3 "Gate Hardware Sets" Article.

2.03 EXIT DEVICES

A. Exit Devices: BHMA A156.3, Grade 1.

B. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.

C. Outside Trim: As scheduled in Part 3 "Gate Hardware Sets" Article.

2.04 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.

1. Comply with all keying requirements of Owner.

B. Keys: Nickel silver.

1. Stamping: Permanently inscribe each key with a visual key control number and include the notation “DO NOT DUPLICATE.”

2. Quantity: In addition to one extra key blank for each lock, provide the following (as applicable):

a. Cylinder Change Keys: Three.

2.05 OPERATING TRIM

A. Operating Trim: BHMA A156.6.

2.06 MECHANICAL STOPS AND HOLDERS

A. Floor-Mounted Stops: BHMA A156.16.

2.07 AUXILIARY DOOR HARDWARE

A. Auxiliary Hardware: BHMA A156.16; Grade 1.

2.08 PERFORATED STEEL PANEL

A. Shall be as indicated on drawings.

2.09 FABRICATION

A. Manufacturer’s Nameplate: Do not provide products that have manufacturer’s name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.

1. Manufacturer’s identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce gate hardware units of base metal, fabricated by forming method indicated, using manufacturer’s standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified gate hardware units and BHMA A156.18.

C. Fasteners: Provide gate hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of gate hardware, unless otherwise indicated.

2.10 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware sets.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before stripping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in

appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine gates and frames, with Installer present, for compliance with requirements for installation tolerances, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Steel Doors and Frames: For surface-applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

3.03 INSTALLATION

A. Mounting Heights: Mount gate hardware units at heights indicated as follows unless otherwise indicated or required to comply with governing regulations.

1. Operating Hardware: Between 34 inches and 44 inches above finish floor, per 2022 California Building Code Section 11B-404.2.7.

B. Install each gate hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.

2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Stops: Provide door stops as scheduled in Part 3 "Door Hardware Sets" Article.

1. Do not mount floor stops where stop will impede traffic.

3.04 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of gate hardware and each gate to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended.

3.05 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by gate hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that gate hardware is without damage or deterioration at time of Substantial Completion.

3.06 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain gate hardware and gate hardware finishes. Refer to the General Conditions requirements.

3.07 GATE HARDWARE SETS

A. Gate hardware shall be as indicated on the plans.

END OF SECTION

SECTION 116710 – OUTDOOR ADULT FITNESS EQUIPMENT

PART 1 GENERAL

1.01 DESCRIPTION

A. This specification is for commercial outdoor adult fitness equipment designed for use in public settings.

B. Related Sections
1. Section 033000 - Cast in Place Concrete
2. Section 312300 - Excavation and Fill
3. Section 320523 - Concrete for Exterior Improvements
4. Section 334000 - Storm Drainage Utilities

1.02 QUALITY ASSURANCE

A. Equipment and Design Qualifications
1. All outdoor adult fitness equipment shall comply with all the requirements of voluntary ASTM F3101-15 and provide wheelchair accessible equipment as called out.
2. See plans for uses zones requirements and placement of all outdoor adult fitness equipment.
3. Use only new materials and products unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

B. Manufacturer Qualifications
1. The manufacturer of the outdoor adult fitness equipment must specialize in outdoor fitness equipment and have a minimum of 10 years of experience in manufacturing outdoor adult fitness equipment.
2. The manufacturer must offer the following equipment options: equipment that uses a percentage of the users' body weight for resistance, is hydraulic with adjustable resistance, fitness rigs for cross fit training and a full line of wheelchair accessible options.

1.03 SUBMITTALS

A. Refer to the General Conditions.

B. Submit layout drawing complete with fall zones and clearance between and around all equipment and written specifications.

C. Submit complete product warranty statement.

1.04 WARRANTY AND GUARANTEE

A. Refer to the General Conditions.

B. Manufacturers Limited Warranty – 10 year on metal structures, 5 year moving parts, 5 year on seats and backrest, 3 year hydraulic pistons and 2 year on footrests, armrests, and rubber parts.

C. Submit a written warranty covering all materials and workmanship used for installation of the equipment under this Section for a period of no less than (1) year from the date of filing of Notice of Completion.

1.05 APPLICATION STANDARDS

A. ASTM F3101-15 - voluntary standard specification for unsupervised public use outdoor fitness equipment.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manufacturer: Greenfield Outdoor Fitness Anaheim, CA. To obtain a quote contact All About Play Inc at 916-923-2180 or e-mail info@playgroundpros.com.

B. Fitness Equipment Layout: See drawing for top view of outdoor adult fitness equipment layout.

C. Equipment Component Specifications:

1. All Steel Tube Components shall be pre-galvanized. The components shall be free of excess weld spatter and shall be cleaned and cold galvanized after fabrication and prior to polyester dry powder coating. All steel components shall have a minimum warranty of 10 years.

2. Paint shall be Orange Peel DuPont powder coating with UV protection.

3. HDPE Plastic Parts shall be molded from high density polyethylene with ultraviolet light stabilizers, anti-static guard, color molded in and offer low heat conductivity. All seats and backrests shall be made of HDPE and have a minimum warranty of 5 years.

4. LDPE Plastic Parts shall be molded from low density polyethylene with ultraviolet light stabilizers, anti-static guard, color molded in and offer low heat conductivity. All footrests and armrests shall be made of LDPE and have a minimum warranty of 2 years.

5. Rubber Parts shall be made from natural rubber and molded to make parts as needed for user and equipment protection. Built-in rubber safe stops limit the movement of parts that are designed to move to protect user and equipment. Rubber constructed hand grips are used on 3” diameter tubes to prevent protrusions and comfortable place for users to grip equipment. Rubber hand grips shall be 3” in diameter, 6” long and 1.75” thick. All rubber parts shall have a minimum warranty of 2 years.

6. Hardware: All Hardware used in the assembly of components shall be stainless steel and tamper resistant. All necessary hardware shall be provided. All hardware shall have a minimum warranty of 5 years.

7. 2RS Sealed Ball-Bearings shall be used where two parts come together and moving connections is required. They shall have a minimum life cycle of 10,000 hours and shall have a rubber seal on both sides. They are sealed and do not require any type of field lubrication. Bushing and 2Z bearing connections will not be accepted. All 2RS sealed ball-bearings shall have a minimum warranty of 5 years.

8. Age Appropriate Signs and User Instructions shall be mounted to each piece of equipment. Equipment signs must also have a QR code featuring "How To" videos for users to preview before using equipment.

9. Custom Printed Announcement Sign shall have a post constructed of pre-galvanized steel tubing cold galvanized after fabrication and coated with Orange Peel DuPont powder coated paint. Sign board shall be 26.125" X 39.375" and made of aluminum and attached to post with stainless steel hardware in 9 locations. Sign board will shall be printed with full-color graphics and coated with a UV protective film. All custom printed announcement signs shall have a minimum warranty of 10 years.

10. Greenfields App: For both Android and Apple phones, offers the following features:
    a. Park locator within 30 mile radius
    b. QR Code Scanner – scan view info on each unit
    c. Instructional Videos - how-to videos for exercises available on each unit
    d. My Workout Routine – create your own workouts
    e. Progress – Workout History: keep track of your personal performance over time
    f. Progress – Weight Progress: keep track of your weight progress towards your goal
    g. Progress – Personal BMI: keep track of Body Mass Index progress toward your goal
    h. Coming soon: Exercises not requiring equipment.

11. Equipment selected list below. All equipment is to be in-ground mounted in standard color scheme.
    a. SGR019 - 2-Person Incline Sit-up Bench
    b. SGR042 - 2-Person Back & Arms Combo
    c. SGR045 - 2-Person Pull-Up Station
    d. SGR048W - 2-Person Wheelchair Accessible Lat Pull Down
    e. SGR048AW - 2-Person Wheelchair Accessible Chest Press
    f. SHP507 - 2-Person Static Combo

PART 3 EXECUTION

3.01 INSPECTION

A. Verify that the site is ready and that the specified equipment may be installed in accordance with the plan and the approved design.

B. In event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.02 INSTALLATION

A. Locate equipment in accord with approved shop drawings.

B. Fitness equipment footing shall be installed according to the footing details shown on the installation detail. Standard installation method is surface mounted unless specified in-ground mounting. Surface mounted still requires footings.

C. All equipment should be installed plumb and true, in accordance with the manufacturer's printed directions.

D. Upon completion of installation make sure all labels and stickers provided from the manufacturer are firmly affixed to the equipment. (age labels with user instructions)

E. All painted surfaces need to be touched up and free from scratches and dents that may have occurred during shipping or installation.

3.03 CLEAN UP

A. Upon completion of installation thoroughly wash down fitness equipment and remove all foreign materials from the equipment area. Leave entire work area in a neat, orderly, clean and acceptable condition. Replace any damaged parts and surfaces which are not free from imperfections.

END OF SECTION

SECTION 129300 TRACK SITE FURNISHINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish all labor, materials, miscellaneous hardware, foundations, miscellaneous appurtenances, facilities, transportation and services required for installation of all site furnishings and related work as shown on the Drawings and/or specified herein.

1.2 SUMMARY OF WORK

A. The general extent of work contained in this section is shown on the drawings and can include, but may not be limited to, installation of the following:

1. Discus Cage
2. Discus Ring
3. Shot Put Ring
4. Shot Put Cage
5. Shot Put ToeBoard
6. Aco Drain and ACO drain catch Basin
7. Combox

1.3 RELATED SECTIONS

A. Section 033000 – Cast in Place Concrete

1.4 REFERENCES AND REGULATORY REQUIREMENTS

A. California Building Code

1.5 SUBMITTALS

A. Conform to General Conditions, Division Thirty One – Thirty Three specifications, and Special Provisions.

B. Product Data: Submit catalog “cut sheets” of all materials and equipment proposed to be furnished and/or installed under this portion of the work. Include the manufacturers and distributors name, sub-contractor as applicable. Insure that the “cut sheets” clearly describe the specific product by catalog number and that additional non-specified products that may appear on the same “cut sheet” are crossed out where applicable.

C. Samples: Submit samples of colors and finishes for all applicable products and furnishings for selection by District’s Representative.

D. Shop Drawings: Submit complete shop drawings for all materials or furnishings requiring field or shop fabrication.

1.6 QUALITY ASSURANCE

A. Review: All equipment shall be reviewed for conformance with the intent of the Contract Documents and accepted by the contractor prior to installation. All site furnishings shall be in a new, “first-class” condition, per the discretion of the District’s Representative, prior to Final Acceptance.

1.7 DELIVERY, STORAGE, HANDLING

A. The contractor is responsible for coordination of the delivery, acceptance, handling and storage of all site furnishings.

B. Store and handle site furnishings as acceptable to the District's Representative and so that work or access of others is not impeded.

C. The contractor shall protect all site furnishings from theft or damage at all times until such items have been accepted by the District.

PART 2 - PRODUCTS

	Description	Manufacturer	Model #	Finish/ Color	Distributor/Contact
A.	Discus Cage	Sportsfield Specialties	**DCHS** Reinforced Discus throw form		Sportsfield Specialties 41155 State Highway 10 PO Box 231 Delhi, NY. 13753 www.sportsfieldspecialties.com Alex Fletcher 408-728-0482
B.	Discus Ring	Sportsfield Specialties	**TRDAW** Reinforced Discus throw form		Sportsfield Specialties 41155 State Highway 10 PO Box 231 Delhi, NY. 13753 www.sportsfieldspecialties.com Alex Fletcher 408-728-0482
C.	Shot Put Ring	Sportsfield Specialties	**TRSPHAW** Resinforced shot put ring		Sportsfield Specialties 41155 State Highway 10 PO Box 231 Delhi, NY. 13753 www.sportsfieldspecialties.com Alex Fletcher 408-728-0482
D.	Shot Put Toe Board	Sportsfield Specialties	**SPTBCARHS**		Sportsfield Specialties 41155 State Highway 10 PO Box 231 Delhi, NY. 13753 www.sportsfieldspecialties.com Alex Fletcher 408-728-0482
E.	Shot Put Cage	Sportsfield Specialties	**SPC**		Sportsfield Specialties 41155 State Highway 10 PO Box 231 Delhi, NY. 13753 www.sportsfieldspecialties.com Alex Fletcher

					408-728-0482
F.	Aco 3000 slot Drain And Aco Catch Basin with plastic trash basket	Sportsfield Specialties		N/A	ACO, Inc. www.ACOSWM.com 888-417-6755
G.	COMMUNICATION BOX FOR TRACK MATERIAL	Sportsfield Specialties	**CBTS1830**		Sportsfield Specialties 41155 State Highway 10 PO Box 231 Delhi, NY. 13753 www.sportsfieldspecialties.com Alex Fletcher 408-728-0482

PART 3 - EXECUTION

3.1 SEQUENCING AND SCHEDULING

A. Coordinate construction timing of installation of site furnishings in conformance with all other pertinent work.

B. Concrete footings shall conform to requirements of Section 033000 cast in place concrete unless noted otherwise.

3.2 INSTALLATION

A. Concrete Footings: Install per manufacturer's instructions and landscape plans unless noted otherwise as shown in Drawings.

B. Discus cage and shot put cage sleeves shall be installed in footing per manufacturer's instructions and landscape plans

C. Equipment:

1. Conform to layout shown on Drawings.
2. Erect site furnishings in strict conformance with Details, accepted Shop Drawings, and manufacturer's instructions. If specified equipment and/or materials are revised, plans and Drawings are subject to revisions based on manufacturers.

3.3 FIELD QUALITY CONTROL

A. All site furnishings shall be inspected and accepted upon delivery by the Contractor. Final acceptance of site furnishings and locations of site furnishings shall be per the direction of the District's representative.

END OF SECTION

SECTION 260000 - GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 REFERENCE

A. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

1.02 DESCRIPTION

A. The intent of drawings and Specifications is to obtain complete systems tested, adjusted, and ready for operation.

B. Except as otherwise defined in greater detail, the terms "provide", "furnish" and "install" as used in Electrical Division 26 Contract Documents shall have the following meanings:

1. "Provide" or "provided" shall mean "furnish and install".

2. "Furnish" or "furnished" does not include installation.

3. "Install" or "installed" does not include furnishing.

C. Include incidental details not usually shown or specified, but necessary for proper installation and operation.

D. Check, verify and coordinate work with drawings and specifications prepared for other trades. Include modifications, relocations or adjustments necessary to complete work or to avoid interference with other trades.

E. Included in this Contract are electrical connections to equipment provided by others. Refer to Architectural, Mechanical, Plumbing, and final shop drawings for equipment being furnished under other sections for exact locations of electrical outlets and various connections required.

F. Information given herein and on drawings is as exact as could be secured but is not guaranteed. Do not scale drawings for dimensions.

G. Perform work in "neat and workmanlike" manner as defined in ANSI/NECA 1, Standard Practices for Good Workmanship in Electrical Contracting.

1.03 RELATED WORK

A. Utility Services:

1. Determine utility connection requirements and include in Base Bid all costs to District for utility service.

2. Include costs for temporary service, temporary routing of service or other requirements of a temporary nature associated with utility service.

B. Temporary Services:

1. Division 01 - Temporary Utilities.

C. Continuity of Service:

1. No service shall be interrupted or changed without permission from District's Representative. Obtain written permission before work is started.

2. When interruption of services is required, District's Representative, and other concerned parties shall be notified and shall determine a time.

D. Concrete Work:

1. Concrete shall comply with Division 03 - Concrete.

E. Painting:

1. Furnish equipment with factory-applied finish coats.

2. Furnish equipment with factory applied prime finish unless otherwise specified.

3. If factory finish on equipment furnished by Contractor is damaged in shipment or during construction, refinish equipment to satisfaction of District's Representative.

4. Furnish one can of touch up paint for each final factory-applied finish coat of product.

1.04 REQUIREMENTS OF REGULATORY AGENCIES

A. Rules and regulations of Federal, State and local authorities and utility companies, in force at time of execution of Contract shall become part of this specification.

1.05 REFERENCE STANDARDS

A. Agencies or publications referenced herein refer to the following:

1. AEIC Association of Edison Illuminating Companies

2. ANSI American National Standards Institute

3. ASME American Society of Mechanical Engineers

4. ASTM American Society for Testing and Materials

5. BICSI Building Industry Consulting Services International

6. EIA Electronic Industries Association

7. FIPS Federal Information Processing Standards
8. FCC Federal Communications Commission
9. ICEA Insulated Cable Engineers Association
10. IEEE Institute of Electrical & Electronics Engineers
11. IESNA Illuminating Engineering Society of North America
12. NEC National Electrical Code
13. NECA National Electrical Contractors Association
14. NEMA National Electrical Manufacturers Association
15. NESC National Electrical Safety Code
16. NETA National Electrical Testing Association
17. NFPA National Fire Protection Association
18. NIST National Institute of Standards & Technology
19. OSHA Occupational Safety and Health Administration
20. TIA Telecommunications Industries Association
21. UL Underwriters Laboratories, Inc.

B. Work shall be in accordance with latest edition of codes, standards or specifications unless noted otherwise.

1.06 LISTING

A. Install materials bearing UL label or UL listing, unless UL label or listing is not available for that type of material.

B. Other nationally recognized testing agencies, acceptable to AHJ, are approved.

1.07 ENCLOSURES

A. Typical NEMA Enclosures and Usage

1. NEMA 1 - Indoors. Falling dirt.
2. NEMA 2 - Indoors. Falling dirt. Falling liquids. Light splashing.
3. NEMA 3 - Outdoors. Sleet, snow, rain. Windblown dust.
4. NEMA 3X - Same as NEMA 3 plus corrosion resistant.
5. NEMA 3S - Same as NEMA 3 plus mechanism operable when ice covered.

6. NEMA 3SX - Same as NEMA 3S plus corrosion resistant.

7. NEMA 3R - Outdoors. Rain, snow, sleet.

8. NEMA 3RX - Same as NEMA 3R plus corrosion resistant.

9. NEMA 4 - Indoors. Falling dirt. Falling and light splashing liquids. Flying dust, lint and fibers. Hose down.

10. NEMA 4X - Same as NEMA 4 - Indoors plus corrosion resistant.

11. NEMA 4 - Outdoors. Rain, sleet, snow. Wind-blown dust. Hose down.

12. NEMA 4X - Same as NEMA 4 - Outdoors plus corrosion resistant.

13. NEMA 5 - Indoors. Falling Dirt. Falling Liquids. Settling dust, lint and fibers.

14. NEMA 6 - Indoors. Falling dirt. Falling and light splashing liquids. Flying dust, ling and fibers. Hose down. Temporary submersion.

15. NEMA 6P - Same as NEMA 6 - Indoors plus corrosion resistant. Prolonged submersion.

16. NEMA 6 - Outdoors. Rain, snow, sleet. Windblown dust. Hose down. Temporary submersion.

17. NEMA 6P - Same as NEMA 6 - Outdoors plus corrosion resistant. Prolonged Submersion.

18. NEMA 7 - Indoors. Class I, Division 1 or 2, Groups A, B, C or D. (Flammable gas).

19. NEMA 9 - Indoors. Class II, Division 1 or 2. Groups E, R, or G. (Combustible dust).

20. NEMA 12 - Indoors. Falling Dirt. Falling liquids. Flying dust, lint and fibers. Oil or coolant seepage.

21. NEMA 13 - Same as NEMA 12 plus oil or coolant spraying or splashing.

1.08 SUBMITTALS

A. Shop Drawings (Product Data):

1. Refer to Division 01 - Submittal Procedures.

2. Note that for satisfying submittal requirements for Division 26, "Product Data" is usually more appropriate than true "Shop Drawings" as defined in Division 01. However, the expression "Shop Drawings" is generally used throughout Specification.

3. Submit shop drawings for equipment and systems as requested in respective specification sections. Submittals which are not requested may not be reviewed.

4. Specifically mark general catalog sheets and drawings to indicate specific items submitted and its correlation to specific designation for product in drawings.

5. Specifically indicate proper identification of equipment by name and/or number, as indicated in specification and shown on drawings.

6. When manufacturer's reference numbers are different from those specified, provide correct cross-reference number for each item. Clearly mark and note submittal accordingly.

7. Submit complete record of required components when luminaires, equipment and items specified include accessories, parts and additional items under one designation.

8. Include wiring diagrams for electrically powered or controlled equipment.

9. Submit electrical equipment room layouts drawn to scale, including equipment, raceways, accessories and required working clearances. Submit electrical equipment room layouts concurrently with electrical distribution equipment submittals.

10. Where submittals cover products containing non-metallic materials, include "Material Safety Data Sheet" (MSDS) from manufacturer stating physical and chemical properties of components and precautionary considerations required.

11. Submit shop drawings or product data as soon as practicable after signing contracts. Submittals must be approved before installation of materials and equipment.

12. Submittals that are not complete, not permanent, or not properly checked by Contractor, will be returned without review.

B. Certificates and Inspections:

1. Obtain and pay for inspections required by authorities having jurisdiction and deliver certificates approving installations to District unless otherwise directed.

C. Operation and Maintenance Manuals:

1. Refer to Division 01 - Operation and Maintenance Data.

2. Upon completion of work but before final acceptance of system, submit to District’s Representative for approval, 3 copies of operation and maintenance manuals in loose-leaf binders. If "one copy" is larger than 2” thick or consists of multiple volumes, submit only one set initially for review. After securing approval, submit 3 copies to District’s Representative.

3. Organize manuals by specification section number and furnish table of contents and tabs for each piece of equipment or system.

4. Manuals shall include the following:

a. Copies of shop drawings

b. Manufacturer's operating and maintenance instructions. Include parts lists of items or equipment, with component exploded views and part numbers. Where manufacturer's data includes several types or models, designate applicable type or model.

c. CD-ROMs of O&M data with exploded parts lists where available.

d. Phone numbers and addresses of local parts suppliers and service companies

e. Internet/WEB page addresses where applicable

f. Wiring diagrams

g. Start up and shut down procedure

h. Factory and field test records

i. Additional information, diagrams or explanations as designated under respective equipment or systems specification section

5. Instruct District's representative in operation and maintenance of equipment. Instruction shall include complete operating cycle on all apparatus.

6. Furnish O&M manuals and instructions to District Representative prior to request for final payment.

D. Record Documents:

1. Refer to General Conditions of Contract and Division 01 - Project Record Documents. Prepare complete set of record drawings in accordance with Division 01.

2. Use designated set of prints of Contract Documents as prepared by District's Representative to mark-up for record drawing purposes.

3. Provide approved power system in a 3-ring binder 2" max. thickness. Include the SKM power system study modeling file on a thumb drive attached to the binder.

1.09 JOB CONDITIONS

A. Building Access:

1. Arrange for necessary openings in the building to allow for admittance of all apparatus.

2. Electric rooms in the custody of the District (supplying power to campus programs or entities)

1) Only authorized and trained individuals may have access to electrical rooms.

2) Electric rooms are to be supervised by an authorized person when the doors open and work is commencing.

3) Electric rooms will not be left unattended while the door is open.

4) Dust control for work will be used at all times to protect new or existing equipment.

5) All provisions regarding electrical safety per NFPA 70E will be followed.

3. Electrical rooms in the custody of the Contractor (not supplying power to campus programs or entities)

1) Contractor is responsible for coordinating access with trades and work groups.

2) All provisions regarding electrical safety per NFPA 70E will be followed.

3) Dust control for work will be used at all times to protect existing or new equipment.

B. Coordination:

1. Equipment provided under other Divisions of these specifications.

a. Booster Pump

b. Electrically powered equipment

2. Provide the following devices required for control of electrical equipment, unless noted otherwise:

a. Control devices

1) Lighting Control Panel

b. Conduit, boxes, and wiring for Power wiring

3. Connect and wire equipment, complete and ready to operate according to wiring diagrams furnished by various trades.

4. Wire starters or other similar control devices furnished by others.

5. This contractor's drawings and/or specifications show number and hp rating of motors furnished by others, together with their actuating devices.

Should any change in size, hp rating, voltage, or means of control be made to any motor or other electrical equipment after Contracts are awarded, Contractor responsible for change shall immediately notify this Contractor. Additional costs due to these changes shall be responsibility of Contractor initiating change.

6. Equipment and wiring shall be selected and installed for conditions in which it will be required to perform. (i.e., general purpose, weatherproof, rain tight, explosion proof, dust tight, or any other special type as required.)

7. Comply with local utility motor starting requirements and provide starters for motors furnished by others as specified herein or under various trade sections of those specifications.

C. Cutting and Patching:

1. Refer to section 26 05 43 - Grounding and Bonding for Electrical Systems

2. Perform cutting and patching required for complete installation of systems, unless otherwise noted. Patch and restore work cut or damaged to original condition. This includes openings remaining from removal or relocation of existing system components.

3. Provide materials required for patching unless otherwise noted.

4. Do not pierce beams or columns without permission of District's Representative and then only as directed. If openings are required through walls or floors where no sleeve has been provided, hole shall be core drilled to avoid unnecessary damage and structural weakening.

5. Where alterations disturb lawns, paving, walks, etc., replace, repair or refinish surfaces to condition existing prior to commencement of work. This may include areas beyond construction limits.

D. Housekeeping and Cleanup:

1. Refer to Division 01 - Closeout Procedures.

2. As work progresses or as directed by District's Representative, periodically remove waste materials from building and leave area of work broom clean. Upon completion of work, remove tools, scaffolding, broken and waste materials, etc. from site.

1.10 WARRANTY

A. Refer to Division 01 for general warranty requirements.

B. Refer to technical sections for warranty requirement for each system.

C. Repair, replace, or alter systems or parts of systems found defective at no extra cost to District.

D. In any case, wherein fulfilling requirements of any guarantee, if this contractor disturbs any work guaranteed under another contract, this contractor shall restore such disturbed work to condition satisfactory to District's Representative and guarantee such restored work to same extent as it was guaranteed under such other contract.

E. Warranty shall include labor, material, and travel time.

1.11 DISTRICT REQUIREMENTS

A. Power system study, Electrical Coordination, Fault Duty Assessment, Fire Ignition and Arc Flash:

1. Comply with NFPA 70E – Standard for Electrical Safety in the Workplace and IEEE 1584-2002 Guide for Performing Arc Flash Calculations. Perform an Arc Flash Hazard Analysis to determine the Flash Hazard Boundary, Incident Energy, Hazard Risk Category, Shock Hazard Voltage, Required Glove Class, Limited Approach Boundary, Restricted Approach Boundary and Prohibited Approach Boundary.

2. Submit arc flash label with above data to the District representative for approval. Label will be consistent with existing labels on campus.

3. At a minimum, the following electrical equipment will be studied: All Switchgear, Distribution Boards, Panel Boards, Equipment Disconnects, Transformer Enclosures, lighting control panels, and any electrical enclosure with a hinged door.

PART 2 - PRODUCTS

2.01 GENERAL

A. Provide all electrical distribution equipment from a single source manufacturer

2.02 PRODUCT SUBSTITUTIONS

B. Refer to Division 01 - Product Requirements

PART 3 - EXECUTION

3.01 GENERAL

A. Verify elevations and dimensions prior to installation of materials.

3.02 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the site under provisions of Division 01.

B. Store and protect products under provisions of Division 01.

C. Store in clean, dry space.

D. Maintain factory wrapping or provide cover to protect units from dirt, water, construction debris, and traffic.

E. Handle in accordance with manufacturer’s written instructions.

F. Handle carefully to avoid damage to components, enclosure, and finish. Lift only with lugs provided for the purpose.

G. Provide supplemental heat if required to prevent moisture contamination.

3.03 FLOOR, WALL, ROOF AND CEILING OPENINGS

A. Coordinate location of openings, chases, furred spaces, etc. with appropriate Contractors. Provide sleeves and inserts that are to be built into structure during progress of construction.

B. Remove temporary sleeves, if used to form openings, prior to installation of permanent materials. Utilize minimum 24 ga galvanized sheet metal for permanent sleeves unless otherwise noted.

C. Provide Schedule 40 carbon steel pipe with integral water stop for steel sleeves required below grade or to exterior.

D. Submit to Structural Engineer for review and approval size and location of core-drilled holes prior to execution.

E. Submit product data and installation details for penetrations of building structure. Include schedule indicating penetrating materials, (steel conduit, PVC conduit, cables, cable tray, etc.), sizes. of each, opening sizes and sealant products intended for use.

F. Submit complete penetration layout drawings showing openings in building structural members including floor slabs, bearing walls, shear walls, etc. Indicate and locate, by dimension, required openings including those sleeved, formed or core drilled. Submit drawings for approval prior to preparing openings in structural member.

G. Provide 2” clearance around penetration openings intended for raceways and cables. Where fire resistant penetrations are required, size openings in accordance with written recommendations of firestopping systems manufacturer.

H. Seal non fire-rated floor penetrations with non-shrink grout equal to Embeco by Master Builders, or urethane caulk, as appropriate.

I. Seal non-rated wall openings with urethane caulk.

J. Where penetrations occur through exterior walls into building spaces, use steel sleeves with integral water stop, similar to type "WS" wall sleeves by Thunder line Corporation. Seal annular space between sleeves and pipe with "Link-Seal" modular wall and casing seals by Thunder line Corporation, or sealing system by another manufacturer approved as equal by District’s Representative. Sealing system shall utilize Type 316 stainless steel bolts, washers and nuts.

K. Finish and trim penetrations as shown on details and as specified.

L. Provide chrome or nickel-plated escutcheons where raceways pass through walls, floors or ceilings and are exposed in finished areas. Size escutcheons to fit raceways for finished appearance. Finished areas shall not include mechanical/electrical rooms, janitor’s closets, storage rooms, etc., unless suspended ceilings are specified.

M. In Bio-safety and wash-down areas,

1. Exposed conduit penetrations shall be sealed as follows:

a) Escutcheons shall not be used when conduits are exposed in finished areas and penetrate finished surfaces.

b) Cut and patch penetration to within 1/4” of conduit.

c) Seal openings around conduit and patch work with sealants specified in Division 07.

d) Joint Sealants. Sealant shall be installed per the manufacturer's application requirements.

2. Penetrations other than conduits (junction boxes, light fixtures, etc.), including wiring devices, shall be sealed as follows:

a) Seal non-rated opening with silicone sealant.

b) See drawings for details.

c) Confirm selected sealant is compatible with paint provided by others prior to application.

d) Product: One-Part Mildew-Resistant Silicone Sealant: Type S; Grade NS; Class 25;Uses NT, G, A, and as applicable to nonporous joint substances indicated, O; formulated with fungicide; intended for sealing interior joints with nonporous substrates and subject to in-service exposure to conditions of high humidity and temperature extremes; subject to compliance with requirements. Provide one of the following:

i. 786 Mildew Resistant Silicone Sealant; Dow Corning Corp. or equal

ii. Sanitary 1700 Silicone Sealant; General Electric Co. or equal

iii. 898 Silicone Sanitary Sealant; Pecora Corp. or equal

iv. Tremsil 600; Tremco Corp. or equal

v. OmniPlus; Sonneborn Building Products Div., Rexnord Chemical Products, Inc. or equal

3.04 EQUIPMENT ACCESS

A. Install raceways, junction and pull boxes, and accessories to permit access to equipment for maintenance. Relocate raceways or accessories to provide maintenance access at no additional cost to District.

B. Install equipment with sufficient maintenance space for removal, repair or changes to equipment. Provide ready accessibility to equipment and wiring without moving other future or installed equipment.

C. Access doors for equipment shall provide access for servicing, repairs, and/or maintenance.

D. Provide access doors in walls, chases or inaccessible ceilings for equipment requiring access for servicing, repairs and maintenance, unless otherwise noted. Access frames and doors shall be as manufactured by Milcor, Incorporated, or similar, of style applicable to surface. Provide access doors used in fire-rated construction with UL label. Provide steel, prime-coated access doors in dry locations. Provide stainless steel access doors for use in ceramic tile walls, toilet rooms, locker rooms, and in areas subject to excessive moisture. Provide access doors of sufficient size to allow complete maintenance. Coordinate location of access doors with General Contractor and rough- in equipment accordingly.

E. Locate electrical outlets and equipment to fit details, panels, decorating or finish at space. District's Representative reserves right to make minor position changes of outlet locations before work has been installed.

F. Verify door swings before installing room light switch boxes. Install boxes on latch side of door unless otherwise noted

G. Provide access to electrical equipment, raceway pullboxes and junction boxes no higher than 4' above a revocable ceiling time or access hatch.

3.05 EQUIPMENT SUPPORTS

A. Provide supporting steel not indicated on drawings as required for installation of equipment and materials including angles, channels, beams, hangers, etc.

B. Provide steel shell with plug type concrete anchors for attaching equipment to concrete. Plastic, rawhide or anchors using lead are not allowed.

C. Do not support equipment or luminaires from metal roof decking.

3.06 SUPPORT PROTECTION

A. In occupied areas, mechanical and electrical rooms and areas requiring normal maintenance access, guard certain equipment to protect personnel from injury.

B. Protect threaded rods or bolts at supporting elements as described above. Trim threaded rods or bolts such that they do not extend beyond supporting element.

3.07 ELECTRICAL SYSTEMS IDENTIFICATION

A. Refer to Section 26 05 53 – Electrical Systems Identification

3.08 ACCEPTANCE TESTING

A. Contractor shall engage testing and inspection agency to perform acceptance tests. Equipment to be tested is noted as "Testing by Testing Agency" in technical specification sections.

B. When testing is to be witnessed by District's Representative, notify them at least 10 days prior to testing date.

C. When equipment or systems fail to meet minimum test requirements, replace or repair defective work or materials as necessary and repeat inspection and test until equipment or systems meet test requirements. Make repairs with new materials.

D. Contractor is responsible for certifying in writing equipment and system test results. Certification shall include identification of portion of system tested, date, time, test criteria and name and title of person signing test certification documents.

E. Maintain copies of certified test results, including those for any failed tests, at project site. At completion of project, include copies of test records and certifications in O&M Manuals.

3.09 START-UP

A. Before energization for startup, testing, or use for energization of downstream systems, all electrical equipment must be inspected by the District IOR and/or the appropriate District Representative. All third-party testing should be complete and reports available for review at this time.

B. Systems and equipment shall be started, tested, adjusted, and turned over to District ready for operation. This includes "District-Furnished, Contractor-Installed" (OFCI) and "Contractor- Furnished, Contractor-Installed" (CFCI) systems and equipment.

C. Follow manufacturer's pre-start-up checkout, start-up, trouble shooting and adjustment procedures.

D. Contractor shall provide services of technician/mechanic knowledgeable in start-up and checkout of types of systems and equipment on project.

E. Provide start-up services by manufacturer's representative where specified or where Contractor does not have qualified personnel.

F. Coordinate start-up with all trades.

3.10 CLEANING

A. Clean systems after installation is complete.

B. Vacuum debris from panelboards, switchboards, motor starter and disconnect switch enclosures, junction boxes and pull boxes two weeks before energization and again prior to completion.

C. Where louvers are provided in switchgear or transformer enclosures, vacuum louvers free of dust and dirt.

D. Clean luminaire lenses and lamps at time of installation and clean lens exteriors just prior to final inspection.

E. Thoroughly clean equipment of stains, paint spots, dirt and dust. Remove temporary labels not used for instruction or operation.

END OF SECTION

SECTION 260519 - LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 26 05 33 – Raceway and Boxes for Electrical Systems

B. Section 26 05 33.13 – Surface Raceway

C. Section 26 05 33.33 – Outdoor Ground Boxes for Electrical Systems

1.02 REFERENCE

A. Work under this section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

1.03 DESCRIPTION

A. Section includes conductors and cables rated 600 V and less, connectors, splices, and terminations rated 600 V and less, sleeves and sleeve seals for cables.

B. Conductor and conduit sizes in these contract documents are based on copper wire, and only copper wire shall be used.

1.04 REFERENCE STANDARDS

A. ASTM B 1 – Standard Specification for Hand-Drawn Copper Wire.

B. ASTM B 8 – Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.

C. NEMA WC 70 – Non-Shielded Power Cable 2000 V or less for the Distribution of Electrical Energy (ICEA S-95-658).

D. NFPA 70 – National Electrical Code.

E. UL 44 – Thermoset-Insulated Wires and Cables.

F. UL 83 – Thermoplastic-Insulated Wires and Cables.

G. UL 486A-486B – Wire Connectors.

H. UL 486C – Splicing Wire Connectors.

I. UL 486D – Standard for Insulated Wire Connector Systems for Underground Use or in Damp or Wet Locations.

J. UL 486E – Standard for Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with NFPA 70 for components and installation.
   2. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and indicate

B. Wire and cable boxes and reels shall bear the date of manufacture.
   1. Date of manufacture shall not precede contract date by more than one year.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store in clean, dry space. Protect from dirt, fumes, water, corrosive substances, and construction debris.

1.07 WARRANTY

A. Refer to Division 01 and Section 26 0000 – General Electrical Requirements for general warranty requirements.

B. Manufacturer shall provide standard 1-year warranty against defects in materials and workmanship for products specified in this Section. Warranty period shall begin on date of substantial completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. General Cable Corporation

B. Cerrowire

C. Southwire Company

D. or equal

2.02 DESCRIPTION

A. NEMA WC 70; single copper conductor insulated wire; 600 V rated insulation; 90°C maximum operating temperature for dry and wet or damp locations.

1. ABOVE GROUND, FEEDERS AND BRANCH CIRCUITS - Thermoplastic-insulated wires and cables: NEMA WC 5, UL 83; Type THHN or THWN-2.
2. BELOW GROUND, FEEDERS AND BRANCH CIRCUITS - Thermoset-insulated wires and cables: NEMA WC 3, UL 44; Type XHHW-2 or Thermoplastic-insulated wires and cables: NEMA WC 5, UL 83; Type THW.

B. All conductors will be manufactured in their corresponding phase color identifiers. The use of phase tape or other means is not acceptable.

C. All conductors #8 AWG and larger are to be stranded conductors.

2.03 REMOTE CONTROL AND SIGNAL CIRCIUTS

A. Class 1
1. Copper conductor, single insulated wire.
2. Insulation type THHN-2 rated 90°C, 600 V insulation class.
3. Type XHHW-2 for ambient temperature less than 32°F.
4. ASTM B 8 for stranded conductors. #16 AWG and larger to be stranded conductors.

B. Classes 2 and 3
1. Copper conductor, multiple twisted conductors covered with an overall non-metallic jacket unless otherwise noted.
2. Insulation type XLPE, rated 105°C, 300 V insulation class.
3. UL listed for use in space in which circuits will be installed.

2.04 CONNECTORS, SPLICES, AND TERMINALS

A. Manufacturers:
1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division
5. Tyco Electronics Corp.
6. Or equal

B. Description: UL 486A-486B, UL 486C, UL 486D, UL 486E; factory-fabricated connectors, splices, and terminals of size, ampacity rating, material, type, and class for application and service indicated.

2.05 TERMINATIONS

A. Compression set, bolted or screw type lug, or direct to bolted or screw type terminal.

B. Insulation piercing terminations are not permitted.

C. “Wago” or similar type of termination devices are not permitted.

2.06 PLASTIC CABLES TILES

A. Nylon or approved; locking type; metallic ties not permitted.

PART 3 - EXECUTION

3.01 INSTALLATION OF CONDUCTORS AND CABLES

A. Install conductors in a raceway system, unless otherwise specified or indicated.

B. Install conductors only after:
   1. Mechanical work likely to damage conductors has been completed
   2. Raceway installation is complete and supported

C. Pull conductors into raceway at same time.

D. Neatly train and lace conductors inside boxes, equipment, and panelboards.

E. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

F. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

G. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

H. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible. Protect exposed cables from damage.

I. Support cables above accessible ceiling using plastic cable ties to support cables from structure. Do not rest cable on ceiling panels.

J. Identify and color-code conductors and cables according to Section 26 05 53 - Electrical Systems Identification.

K. Wiring at Outlets: Install conductor at each outlet, with minimum 6" of slack.

L. Limit conduit fill to a maximum of 9 current-carrying conductors provided that derating portion of the NEC is met.

M. Install stranded conductors where conductors terminate in crimp type lugs. Do not place bare stranded conductors directly under screws.

N. Install VFD input wiring, output wiring and control wiring in their own separate conduit systems.

3.02 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper. Stranded for #8 AWG and larger conductors.

B. Branch Circuits: Copper Stranded for #8 AWG and larger conductors.

C. Minimum conductor sizes shall be as follows:
   1. #12 AWG – Branch circuits of any kind.
   2. #14 AWG – Fire alarm system.
   3. #16 AWG – Remote control and signal systems.

D. Branch wiring length limitations:
   1. 208Y/120 V circuits over 100’ in length: Increase wire size one size for each 100’ of length. Increase conduit size as required.
   2. 480Y/277 V circuits over 150’ in length: Increase wire size one size for each 150’ of length. Increase conduit size as required.

3.03 CONDUCTOR INSULATIONS AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Provide type THWN or THHN-2 wire and cable #4/0 AWG size and smaller in dry locations. Provide type THWN-2 wire and cable larger than #4/0 AWG size in wet locations. All conductor sizer shall be fully rated for the entire length of the feeder run. Conductors oversized for voltage drop may be reduced near the end of a conductor to allow termination at devices. Tap conductors from main feeder shall be reduced and allowed by the code.

B. Branch Circuits Single Conductors in Raceway: 90°C rated conductors sized at 75°C rating for connection to equipment and devices.

3.04 REMOTE CONTROL AND SIGNAL CIRCUITS

A. Sizing – #16 AWG minimum.

B. Installation:
   1. Install cables in cable tray and cable rings.
   2. Provide protection for exposed cables where subject to damage.
   3. Support cables above accessible ceilings; do not rest on ceiling tiles.
   4. Use suitable cable fittings and connectors.

3.05 CONNECTORS, SPLICES, AND TERMINALS

A. Connectors:
   1. Except where equipment is furnished with bolted or screw type lug, use compression set pressure connectors with insulating covers. Use compression tools and die compatible with connectors being installed.
   2. Use bolt or compression-set type with application of insulating tape, pre-stretched or heat- shrinkable insulating tubing for splices and taps of #8 AWG conductors and larger. Install with hydraulic compression tool.

3. Use pre-insulated “twist-on” connectors with integral spring for splices and taps of #10 AWG conductors and smaller.
4. Tighten electrical connectors and terminals according to manufacturer’s published torque- tightening values. If manufacturer’s torque values are not indicated, use those specified in UL 486A-486B.
5. Install suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.
6. Wago or other types of push in connectors are not permitted.

B. Splices:
1. Splice wires and cable only in accessible locations such as within junction boxes.
2. Make splices to carry full capacity of conductors with no perceptible temperature rise.
3. Make below-grade splices in manholes and handholes watertight with pre-stretched or heat- shrinkable insulating tubing, or resin-filled insulator.
4. Use electrical tape to build up insulation level equivalent to cable insulation and cover with not less than two half-lapped layers of plastic electrical tape, for joints, taps, and splices of #1 AWG conductors and larger.
5. Plastic snap-on splice insulators are not allowed.
6. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
7. Wago or other types of push in connectors are not permitted.

C. Terminals:
1. Insulate ends of spare conductors with electrical tape and identify spare circuit number where appropriate.
2. Eye type crimped terminal for removable screw type terminal. Forked torque terminal when screw terminal cannot be removed.
3. Train wires to eliminate fanning of stands, crimp with proper tool and die.
4. Torque screw termination per manufacturer’s recommended values.

3.06 CABLE TIES

A. Neatly bundle conductors and cables together for support. Size cable ties sufficiently to accommodate the multiple cables being supported.

3.07 FIELD QUALITY CONTROL

A. Test 600-volt conductors and cables per requirements.

B. Interpret test results in writing and submit to the Owner’s Representative.

C. Replace conductors and cables that are found defective, at no expense to the Owner.

END OF SECTION

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 26 05 33 - Raceway and Boxes for Electrical Systems

1.02 REFERENCE

A. Work under this Section is subject to the requirements of Contract Documents, including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

1.03 DESCRIPTION

A. The section includes methods and materials for grounding systems and equipment, as required by State Codes, NFPA 70, applicable portions of other NFPA codes, as indicated herein, plus the following special applications:
   1. Underground distribution grounding.
   2. Common ground bonding with lightning protection system.

B. Maximum resistance to ground shall be less than 5 ohms.

1.04 REFERENCE STANDARDS

A. ASTM B 3 – Specification for Soft or Annealed Copper Wire

B. ASTM B 8 – Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard or Soft

C. ASTM B 33 – Specification for Tinned Soft or Annealed Copper Wire for Electrical Purposes

D. IEEE C2 – National Electrical Safety Code (ANSI)

E. IEEE 857 – Standard for Qualifying Permanent Connections Used in Substation Grounding

F. NETA MTS – Maintenance Testing Specifications

G. NFPA 70 – National Electrical Code

H. NFPA 70B – Recommended Practice for Electrical Equipment Maintenance

I. UL 467 – Grounding and Bonding Equipment

1.05 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Other Informational Submittals: Plans showing dimensioned as-built locations of grounding features, including the following:
   1. Test wells
   2. Ground rods
   3. Ground rings
   4. Grounding arrangements and connections for separately derived systems
   5. Grounding for sensitive electronic equipment

C. Field Quality-Control Test Reports:
   1. Indicate field test and inspection procedures and interpret test results and corrective action taken for compliance with specification requirements.
   2. Test reports of resistance to earth. Each test report shall include:
      a. Date of test, soil moisture content, and soil temperature
      b. Test operator
      c. Instruments or other test equipment used
      d. Electrode designation or location
      e. Ground impedance in ohms
      f. Assumptions made - if required

D. Closeout Submittals:
   1. Operation and Maintenance Manuals: Include the following:
      a. Instructions for periodic testing and inspection of grounding features at test wells, ground rings, and grounding connections for separately derived systems based on NETA MTS.
         1) Instructions to perform tests to determine if ground resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if they do not.
         2) Include recommended testing intervals.

1.06 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70.
   2. Comply with UL 467 for grounding and bonding materials and equipment.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store products in a clean, dry space. Protect from dirt, fumes, water, corrosive substances, and construction debris.

1.08 WARRANTY

A. Refer to Division 01 and Section 26 00 00 – General Electrical Requirements for general warranty requirements.

B. Manufacturer shall provide standard 1-year written warranty against defects in materials and workmanship for products specified in this Section. Warranty period shall begin on date of substantial completion.

PART 2 - PRODUCTS

2.01 CONDUCTORS

A. Insulated Conductors: tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction, insulation color: green.

B. Bare Copper Conductors:
1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.
4. Bonding Cable: 28 kcmil, 14 strands of #17 AWG conductor, 1/4” in diameter.
5. Bonding Conductor: #4 AWG or #6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8” wide and 1/16” thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8” wide and 1/16” thick.

C. Bare Grounding Conductor and Conductor Protector for Wood Poles:
1. #4 AWG minimum, soft-drawn copper.
2. Conductor Protector: Half-round PVC or wood molding. If wood, use pressure-treated fir or cypress or cedar.

D. Grounding Bus: Horizontal rectangular bars of annealed copper, 3/8” by 4” in cross section, with insulators as indicated on drawings.

2.02 CONNECTORS

A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Electro-tin plated copper or copper alloy, bolted pressure-type, with at least two bolts.

1. Pipe Connectors: Clamp type, sized for pipe.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

D. Compression Connectors: Irreversible type.

2.03 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 3/4” in diameter by 10 ft in length.

Table 1 –TBB conductor size vs length

TBB/GE linear length m (ft)	TBB/GE size (AWG)
less than 4 (13)	6
4 – 6 (14 – 20)	4
6 – 8 (21 – 26)	3
8 – 10 (27 – 33)	2
10 – 13 (34 – 41)	1
13 – 16 (42 – 52)	1/0
16 – 20 (53 – 66)	2/0
20 – 26 (67 – 84)	3/0
26 – 32 (85 – 105)	4/0
32 – 38 (106 – 125)	250 kcmil
38 – 46 (126 – 150)	300 kcmil
46 – 53 (151 – 175)	350 kcmil
53 – 76 (176 – 250)	500 kcmil
76 – 91 (251 – 300)	600 kcmil
Greater than 91 (301)	750 kcmil

PART 3 - EXECUTION

3.01 APPLICATIONS

A. Conductors: Stranded conductors for #16 AWG and larger, unless otherwise indicated.

B. Underground Grounding Conductors: Install bare tinned-copper conductor. No. #4/0 AWG] minimum.
   1. Bury at least 24” below grade.

C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

D. Grounding Bus: Install in electrical and communications rooms, in rooms housing service equipment.
   1. Install bus on insulated spacers 1”, minimum, from wall; 6” above finished floor.
   2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down to specified height above floor, and connect to horizontal bus.

E. Conductor Terminations and Connections:
   1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors
   2. Underground Connections: Welded connectors, except at test wells and as otherwise indicated
   3. Connections to Ground Rods at Test Wells: Bolted connectors
   4. Connections to Structural Steel: Welded connectors

3.02 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4” will extend above finished floor. If necessary, install ground rod before manhole is placed and provide #4/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof PVC sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2” above to 6” below concrete. Seal floor opening with waterproof, non-shrink grout.

C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, catch basins, metallic cover frame and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with #4 AWG minimum, solid, copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits. All connections to be made by non-reversable splicing methods. All fasteners located in manholes to be 316 stainless.

D. Pad-Mounted Transformers and Switches: Install two ground rods and a ground ring around the pad. Ground pad-mounted equipment and non-current-carrying metal items associated with transformers and switches by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than #4/0 AWG for ground ring and for taps to equipment grounding terminals. Bury the ground ring not less than 6” from the foundation.

3.03 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with feeders and branch circuits.
   1. Install a single insulated equipment ground conductor for each branch circuit conduit originating from panelboards.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
   1. Feeders and branch circuits
   2. Lighting circuits
   3. Receptacle circuits
   4. Single-phase motor and appliance branch circuits
   5. Three-phase motor and appliance branch circuits
   6. Flexible raceway runs

7. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power- distribution units.

C. Duplex receptacles of any amperage: Install separate jumper between grounding terminal on device and metallic box.

D. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.

E. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.

F. Size of equipment grounding conductors for branch circuits: As indicated in NEC-70, except minimum size shall be #12 AWG.

G. Size of branch panel feeder originating at switchboards/switchgear: As indicated in NEC-70, except in no instance smaller than #8 AWG.

H. Signal and Communication Equipment: For alarm and other communication equipment (see Telecommunications Grounding System Installation section below for voice and data systems), install #4 AWG minimum grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
   1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4” x 2” x 12” grounding bus.
   2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

I. Install grounding conductor from each standby-emergency generator to grounding electrode system. Provide flexible jumper between base and isolated generator

J. Install equipment grounding conductor from secondary side of each transformer to grounding electrode system as required for separately derived system.

K. Install grounding conductor to luminaires hanging from conduit swivel hangers.

L. Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch- circuit conductors to pole base. Grounding Conductor: Same size as phase conductors, but not smaller than #10 AWG.
   1. Install at each pole or standard a concealed driven 1/2” x 8’-0” ground rod, ground clamp and No. 3 stranded copper conductor concealed and attached to pole and base.

3.04 SEQUENCING, SCHEDULING

A. Permanently attach service grounds before permanent building service is energized.

B. Permanently attach equipment grounds prior to energizing equipment.

3.05 INSTALLATION

A. Connections: Exposed and visible for inspection at all times. Do not install insulation over ground connections.

B. Identify all grounding conductors by system and room number of termination at building grounding electrode point.

C. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

D. Common Ground Bonding with Lightning Protection System: Comply with NFPA 780 and UL 96A when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

E. Ground Rods: Drive rods until tops are 2” below finished floor or final grade, unless otherwise indicated.
   1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.

F. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes shall be at least 12” deep, with cover.
   1. Test Wells: Install at least one test well for each service, unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

G. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
   1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
   2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
   3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

H. Grounding and Bonding for Piping:
   1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building’s main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a

dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end. Water pipe, by itself, is not an adequate grounding electrode and must be supplemented by another electrode system. Bond system together.

2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

I. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned copper bonding jumper to bond across flexible duct connections to achieve continuity.

J. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 ft apart.

K. Make grounding connections on surface that has been cleaned of paint, dirt, oil, etc., so that connections are bare metal to bare metal contact.

L. Make grounding connections tight with UL listed grounding devices, fittings, bushings, etc.

M. Ground Ring: Install a grounding conductor, electrically connected to each building structure ground rod and to each steel column, extending around the perimeter of building.
1. Install tinned-copper conductor not less than #4/0 AWG for ground ring and for taps to building steel.
2. Bury ground ring not less than 24” from building foundation and 30” below grade.

N. Concrete-Encased Grounding Electrode: Fabricate according to NFPA 70, using a minimum of 20’ of bare copper conductor not smaller than #4/0 AWG.
1. If concrete foundation is less than 20’ long, coil excess conductor within base of foundation.
2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building grounding grid or to grounding electrode external to concrete.

O. Equipment Grounding Conductor: Terminate in panelboard at green wire ground bus.

P. Multiple Conductors on Single Lug: Not permitted. Terminate each grounding conductor on its own terminal lug.

Q. Flexible Metallic Conduit, Non-Metallic Rigid Conduit, or Liquid Tight Flexible Conduit: Install green wire grounding conductor with phase conductors in conduit.

3.06 BONDING AND GROUNDING SYSTEM INSTALLATION

A. Provide required elements and miscellaneous hardware necessary to establish Bonding and Grounding infrastructure as specified.

B. Install products in accordance with manufacturer's instructions. Install Compression Connectors with compression, tool-and-die system, as recommended by manufacturer of connectors.

C. Electrical Bonding Conductor, Electrical Bonding Backbone (TBB), and Grounding Equalizer (GE): Exothermic type connections.

D. Locate TGBs and TMGB per drawings.

E. Telecommunications Bonding Backbone (TBB) shall be continuous and not interrupted by Telecommunications Grounding Busbars (TGB).
   1. TGBs shall be bonded to TBB via tap off of TBB. Exception: "last" TGB on TBB (e.g., furthest from TMGB).
   2. Grounding Equalizer(s) (GE) shall connect to TGBs to be interconnected.

F. Insulate busbars from their support.

G. All below grade grounding connections shall be made with exothermic welds.

3.07 FIELD QUALITY CONTROL

A. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
   1. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal , at ground test wells , and at individual ground rods. Make tests at ground rods before any conductors are connected.

B. Test grounding systems per requirements.

C. Interpret test results in writing and submit to Engineer.

D. Inspect completed system by commissioning authority, prior to backfilling.

END OF SECTION

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables

B. Section 26 05 26 – Grounding and Bonding for Electrical Systems

C. Section 26 05 33.13 – Surface Raceway

D. Section 26 05 33.33 – Outdoor Ground Boxes for Electrical Systems

1.02 REFERENCE

A. Work under this section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

1.03 DESCRIPTION

A. Section includes raceways, fittings, wireways, wall ducts, indoor service poles, outlet boxes, pull and junction boxes, floor boxes, tap boxes and raceway seals.

1.04 REFERENCE STANDARDS

A. ANSI/NECA 1 – Standard Practices for Good Workmanship in Electrical Contracting

B. ANSI C80-1 – Rigid Steel Conduit-Zinc Coated (GRS)

C. ANSI C80-3 – Electrical Metallic Tubing-Zinc Coated (EMT)

D. ANSI C80-5 – Aluminum Rigid Conduit-Zinc Coated (ARC)

E. ANSI C80-6 – Intermediate Metal Conduit-Zinc Coated (IMC)

F. ASTM A 53/A 53M – Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

G. BICSI TDMM – Telecommunications Distribution Methods Manual, Latest Edition

H. ETL PVC-001 – PVC-Coated Conduit

I. NEMA 250 – Enclosures for Electrical Equipment (1000 V Maximum)

J. NEMA FB 1 – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing and Cable

K. NEMA OS 1 – Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports

L. NEMA OS 2 – Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports

M. NEMA RN 1 – Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit

N. NEMA TC 2 – Electrical Polyvinyl Chloride (PVC) Conduit

O. NEMA TC 3 – PVC Fittings for Use with Rigid PVC Conduit and Tubing

P. NFPA 70 – National Electrical Code

Q. TIA-569-B – Commercial Building Standard for Telecommunications Pathways and Spaces

R. UL 1 – Flexible Metal Conduit

S. UL 6 – Electrical Rigid Metallic Conduit-Steel

T. UL 6A – Electrical Rigid Metallic Conduit-Aluminum and Stainless Steel

U. UL 360 – Liquid-Tight Flexible Steel Conduit

V. UL 514A – Metallic Outlet Boxes

W. UL 514B – Conduit, Tubing, and Cable Fittings

X. UL 514C – Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers

Y. UL 651 – Schedule 40 and 80 Rigid PVC Conduit and Fittings

Z. UL 797 – Electrical Metallic Tubing-Steel

1.05 SUBMITTALS

A. Product Data:
   1. Floor boxes

B. Manufacturer's Installation Instructions:
   1. Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation and installation of product.

C. Closeout Submittals:
   1. Project Record Documents:
      a. Record actual routing of raceways larger than 2".
      b. Record actual location and mounting heights of wireways, wall ducts, indoor service poles, floor boxes, tap boxes, outlet, pull and junction boxes.
   2. Operation and Maintenance Data:
      a. Include manufacturer's recommended operating instructions, maintenance procedures and intervals, and preventive maintenance instructions.
      b. Include spare parts data listing, source, and current prices of replacement parts and supplies.

1.06 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Comply with NFPA 70.
   2. Furnished products listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

B. Certification:
   1. Installer of PVC-coated conduits and fittings shall be certified by a PVC conduit manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store in a clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect from dirt, water, construction debris, and traffic.

B. Protect PVC conduit from sunlight.

C. Comply with the manufacturer's written instructions.

1.08 WARRANTY

A. Refer to Division 01 and Section 26 00 00 – General Electrical Requirements for general warranty requirements.

B. Manufacturer shall provide standard 1-year written warranty against defects in materials and workmanship for products specified in this Section. Warranty period shall begin on date of substantial completion.

PART 2 - PRODUCTS

2.01 RIGID METAL CONDUIT (RMC)

A. Rigid Steel Conduit (RSC): ANSI C80.1, UL 6; heavy wall galvanized steel

B. Rigid Aluminum Conduit (RAC): ANSI C80.5; heavy wall aluminum

C. PVC-coated rigid steel conduit: NEMA RN 1, ANSI C80.1, UL 6, ETL PVC-001; plastic cap protector caps

D. Fittings (couplings, conduit bodies, connectors and bushings): NEMA FB 1, UL 514B; steel; threaded; connectors with double locknuts and steel insulating bushings, thermoplastic insulating bushings for conduits 2" and smaller; conduit bodies cover: steel, with stainless steel screws and neoprene gaskets; PVC coated to match conduit.

E. No die-cast bodies are acceptable.

F. Fittings Manufacturers: Cooper Crouse-Hinds; Carlon Electric Products/Prime Conduit Inc.; O- Z/Gedney; Appleton; Hubbell or equal;

G. All conduits shall be cast iron. The use of die-cast fittings is not acceptable.

2.02 ELECTRICAL METALLIC TUBING (EMT)

A. ANSI C80.3, UL 797; galvanized steel tubing

B. Fittings (couplings, conduit bodies, and connectors): NEMA FB I, UL 514B; steel, watertight gland compression type connectors with double locknuts and insulated throat; conduit bodies cover: steel, with stainless steel screws and neoprene gaskets. Indentor, drive-on, die-cast or pressure cast fittings not permitted.

C. Fittings Manufacturers: Same as manufacturers listed in 2.1.F.

2.03 FLEXIBLE METAL CONDUIT (FMC)

A. UL 1; interlocked steel

B. Fittings: NEMA FB I, UL 514B; steel

2.04 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. UL 360; interlocked steel, with PVC jacket

B. Fittings: NEMA FB 1, UL 514B; steel

2.05 RIGID NONMETALLIC CONDUIT (RNC)

A. NEMA TC 2, UL 651; Schedule 40 PVC

B. Fittings: NEMA TC 3, UL 651

2.06 OUTLET BOXES

A. Refer to Section for outdoor ground outlet box 26 05 33.33 – Outdoor Ground Boxes for Electrical Systems.

2.07 PULL AND JUNCTION BOXES

A. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1; galvanized steel

B. Cast-Metal, Pull, and Junction Boxes: NEMA FB 1; galvanized, cast iron with ground flange, gasketed cover and stainless-steel cover screws

C. Minimum size: 4” square by 2-1/8” deep for use with 1” conduit and smaller; 4-11/16” square by 2- 1/8” deep for use with 1-1/4” conduit and larger

D. Sheet Metal Boxes Larger Than 12” in any direction: Hinged cover or a chain installed between box and cover

E. Field-fabricated boxes not allowed without prior approval of local authority having jurisdiction.

F. Manufacturers: O-Z/Gedney; Raco; Cooper Crouse-Hinds or equal;

2.08 POKE-THROUGH FITTINGS

A. Poke-Through Fittings: Assembly comprising service fitting, poke-through component, fire stops and smoke barriers, and junction box for conduit termination.
   1. Fire Rating: 3h
   2. Service Fitting Type: Flush
   3. Manufacturers: Hubbell, Legrand/Wiremold, FSR or equal;

2.09 FLOOR BOXES

A. Metal Floor Boxes: NEMA OS1; cast metal and sheet metal; fully adjustable; rectangular; Moisture- proof, with forged brass blank cover with each box and close up covers and/or carpet flanges as required for finished floor.

2.10 MULTISERVICE FLOOR BOXES

A. Above Grade: Stamped steel, watertight design approved for use on above-grade concrete floor applications, with four independent wiring compartments and capacity for up to four duplex receptacles and/or communication services. The box: fully adjustable providing pre-pour and after- pour adjustment, tunnel compartment, and two receptacle brackets. Conduit knockouts per drawing requirements. Comply with UL 514A and UL 514C scrub water exclusion test for tile, terrazzo, carpet and wood floors.

B. On Grade: Cast iron or steel pour box, watertight design approved for use in on-grade and above- grade concrete floor applications, with four independent wiring compartments and capacity for up to four duplex receptacles and/or communication devices. The box: fully adjustable providing pre- pour and after-pour adjustment, tunnel compartment, and two receptacle brackets. Conduit knockouts per drawing requirements. Comply with UL 514A and UL 514C scrub water exclusion test for tile, terrazzo, carpet and wood floors.

C. Covers: Activation Covers – Die-cast aluminum with textured aluminum finish, and black or brass powder-coated paint finishes as selected by the Owner's Representative. Cover: flanged or flangeless, as required, with options for tile or carpet inserts, blank covers, or covers with one or two 1" liquid tight conduit openings for furniture feed applications.

D. Manufacturers:
   1. Hubbell - HBLCFB Series
   2. Legrand/Wiremold - Evolution Series
   3. Or equal

2.11 TAP BOXES

A. Multi-tap connectors as indicated on drawings.

B. Manufacturers: Ilsco;

2.12 EXPANSION FITTINGS

A. Malleable iron, hot dip galvanized allowing 4" (±2") raceway movement.

B. Manufacturers: OZ/Gedney AX Series; or equivalent by manufacturer listed in 2.1.F.

2.13 RACEWAY PENETRATION SEALS

A. Thruwall and Floor Seals.

B. Manufacturers: New construction – OZ/Gedney FSK Series; existing construction – OZ/Gedney CSM Series; or equivalent by manufacturer listed in 2.1.F.

2.14 RACEWAY SEALING FITTINGS

A. For one through four conductors: Manufacturers: OZ/Gedney CSB Series;

B. For greater than four conductors: Manufacturers: OZ/Gedney EYA Series with sealing compound;

C. Low-temperature or hazardous locations: Manufacturers: OZ/Gedney EYA Series with sealing compound;

2.15 CABLE SUPPORTS

A. Manufacturers: OZ/Gedney Type S; or equivalent by manufacturer listed in 2.1.F.

2.16 SLEEVES FOR RACEWAYS

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends, with integral water stop.

B. Sleeves for Rectangular Openings: Galvanized sheet steel with minimum 0.052” or 0.138” thickness and of length to suit application.

C. Integral Water Stop: Manufacturer: Thunderline Corporation;
   1. Steel. Type WS engineered sleeve

2.17 SLEEVE SEALS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and cable.
   1. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
   2. Pressure Plates: Plastic. Include two for each sealing element.
   3. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

PART 3 - EXECUTION

3.01 COORDINATION

A. Coordinate with District Representative size and location of required built-in openings in building structure, including those sleeved, formed or core drilled.

B. Coordinate with District Representative cutting, removing, or piercing general or mechanical insulation, fire-rated walls, ceilings or steelwork.

C. Verify with District Representative all surface raceway installations except in mechanical, electrical, and communications rooms.

D. Coordinate with District Representative exact locations of floor boxes, where shown on drawings, prior to rough-in.

E. Coordinate routing of through-roof conduits.

F. Verify that exterior wall or wet location boxes are gasketed type cast boxes with matching cover.

G. Verify with manufacturer that “touch-up” paint kit and PVC-coating kit are available for use.

3.02 EXAMINATION

A. Examine surfaces to receive raceways and boxes for compliance with installation tolerances and other conditions affecting performance of raceway’s installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.03 INSTALLATION – For additional information See Section 3.4 Application

A. Raceways:
   1. Comply with ANSI/NECA 1 and NFPA 70 for installation requirements applicable to products specified in Part 2 except where requirements on drawings or in this Section are stricter.
   2. Arrange raceways to maintain headroom and present neat appearance.
   3. Raceway routing is shown in approximate locations, unless dimensioned. Route to complete raceway installation before starting conductor installation.
   4. Keep raceways at least 12” away from parallel runs of fuels, steam, hot-water pipes or ductwork. Install horizontal raceway runs above water and steam piping. Install raceways level and square and at proper elevations: 6’-6” minimum headroom, except in exit pathways 7’-0” minimum headroom. Do not block access to junction boxes, mechanical equipment or prevent removal of ceiling panels, etc.
   5. Run raceways concealed in construction to avoid adverse conditions such as heat and moisture, to permit drainage, and to avoid materials and equipment of other trades, except where noted otherwise.
   6. Avoid exposed raceway runs. Run raceways exposed where impractical or impossible to conceal or where specific approval is obtained. Run exposed raceways grouped and parallel or perpendicular to construction. Do not route

exposed raceways over boilers or other high- temperature machinery or in contact with such equipment. Offset exposed raceways at boxes.

7. Route raceways installed above accessible ceilings parallel or perpendicular to construction.
8. Do not install raceways in structural or topping floor slabs, except where noted on the plans. Install raceway in structural or topping floor slabs, where noted on plans, as follows:
    a. Center raceways in structural slabs clear of reinforcing steel, except where crossing same, and spaced on centers equal or exceeding 3 times the raceway diameter. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement. Space raceways laterally to prevent voids in concrete.
    b. Outside diameter of raceway shall not exceed 12”.
    c. Obtain approval from Owner’s Representative for each run of raceway 1” or larger.
    d. Do not install raceways in topping slabs of 2” or less.
    e. Locate raceways to avoid conflict with equipment, door bucks, partitions and other equipment bolted to floor.
    f. Arrange stub-ups so curved portions of bends are not visible above finished slab. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; use flexible metal conduit 6” above the floor. Install threaded plugs flush with floor for future equipmentconnections.
    g. Change from nonmetallic raceway to RMC before rising above floor, with a minimum of 6” of RMC embedded in concrete.
9. Cut raceways square using saw or pipe cutter.
10. Use hydraulic one-shot raceway bender or factory elbows for bends in raceway larger than 2”, unless sweep elbows required. Bend raceways according to manufacturer’s recommendations. Factory fitting are only permitted for PVC and RMC only.
11. Use raceway fittings compatible with raceways and suitable for use and environment.
12. Provide bushings on all raceways.
13. Raceways minimum sizes:
    a. Minimum raceway size 3/4”, except as noted on drawings.
    b. Minimum home run size: 3/4”, except as noted on drawings.
    c. Minimum size for flexible metal conduit is 1/2”.
    d. Minimum size for liquid tight flexible metal conduit is 1/2”
14. Install empty raceways 2-1/2” and larger with 2500# pull tape; install 200 lb nylon pull cord in raceways smaller than 2-1/2”; leave at least 12” of slack at each end of pull wire. Cap raceways at both ends.
15. Feed devices on same wall vertically from above or junction box in suspended ceiling.
    a. Do not install horizontal bends in conduit around corners.
    b. Feed devices in exterior or load-bearing walls by horizontal conduit runs.
16. Raceways Supports:
    a. Independently support or attach raceway system to structural parts of construction. Suspended ceiling systems shall not be considered as structural parts of construction for raceway support. Do not attach raceways to piping system.

b. Raceway supports for horizontal or vertical single runs:
   1) Hot dipped galvanized heavy-duty sheet steel straps, mineralac clamps or steel slotted support channel system with appropriate components.
   2) Spring steel type pressure clamps for raceways 3/4" and smaller.
c. Raceway supports for horizontal and vertical multiple runs:
   1) Trapeze-type supports fabricated with steel slotted channel systems with appropriate components.
   2) Support horizontal runs with appropriately sized rods.
   3) Anchor vertical runs to structure.
   4) Spring-steel type pressure clamps for raceways 3/4" and smaller.
d. Vertical raceway runs 1-1/4" and larger passing through floors: Support at each floor with pipe riser clamps.
e. Do not support raceways with wire, perforated pipe straps or plastic tie-wrap. Remove wires used for temporary support.
f. Secure raceways in metal stud walls to prevent rattling.
g. Arrange raceway supports to prevent misalignment during wiring installation.
h. Do not fasten raceways to corrugated metal roof deck.

17. Identify raceways per requirements in Section 26 05 53 – Electrical Systems Identification.
18. Ground raceways per requirements in Section 26 05 26 – Grounding and Bonding for Electrical Systems.
19. Flexible Conduit Connections: Use maximum of 72" of flexible conduit for recessed and semi- recessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for motors.
    a. Use LFMC in damp or wet locations
20. Install PVC-coated raceways in areas with corrosive atmosphere as noted on plans.
21. Use tools approved for use with PVC coated conduits and fittings.
22. Install stainless steel raceway clamps, mounting hardware, supports, hangers, etc., when
23. located in "wet" or "wash-down" areas.
24. Communications Raceways:
    a. Minimum communications raceway size: 1", unless otherwise noted on drawings.
    b. Install one raceway from each communications outlet box. Horizontal raceway runs between wall outlet boxes are not allowed.
    c. Install insulated bushings on end of each raceway.
    d. Use UL listed metallic grounding clamps, when terminating raceway on cable tray.
    e. Install flush two-gang box with two-gang trim ring for each communications outlet or as noted on drawings.
    f. Install with no more than 270-degrees of bends between pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.
    g. Conduit bend radii (minimum) shall be:
       1) Six (6) times internal conduit diameter for conduit 2" or less internal diameter.
       2) Ten (10) times internal conduit diameter for conduit greater than 2" internal diameter.

h. Conduit bends shall be smooth, even, and free of kinks or other discontinuities that may have detrimental effects on pulling tension or cable integrity during or after installation.
i. Do not install 90-degree condulets. Install continuous radius sweeps of 45-degree minimum for 90-degree bends.
j. Do not install continuous sections longer than 100 ft.
k. Install nylon pull cord in empty raceways. Leave at least 12” of slack at each end of pull wire. Cap raceways at both ends.

25. Power and low-voltage raceways: Minimum 12” separation when run parallel, cross perpendicular.

B. Boxes:
1. Install boxes to accommodate device indicated by symbol, in conformance with code requirements, number and size of conductors and splices and consistent with type of construction.
2. Install the appropriate cover on surface-mounted boxes:
   a. Raised device covers on 4” square and 4-11/16” boxes and handy box covers on handy boxes, etc.
   b. Device covers that are square drawn or square cut on boxes in block.
   c. Tile covers on boxes in tile.
   d. Round drawn device covers on boxes in lath and plaster walls or dry wall only.
   e. Set front edge of device boxes flush with finished wall surfaces except on walls of non- combustible materials where boxes may have maximum set back of 1/4”. Secure flush- mounted box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
3. Set outlet boxes parallel to construction and independently attached to same.
4. Do not install back-to-back and through-the-wall boxes. Install with minimum 6” horizontal separation between closest edges of the boxes. Install with minimum 24” separation in acoustic-rated walls and fire-rated walls.
5. Install multi-ganged boxes where 2 or more devices are in same location, unless otherwise noted.
6. Box Support:
   a. Mount boxes straight.
   b. Install horizontal bracing at top or bottom of box for 3 or more gang device boxes in stud walls.
   c. Install stud support one side, with short piece of stud, for up to 2 gang device boxes.
   d. Do not support boxes with tie-wire.
   e. For one and two gang box support, manufactured bracket supports shall be accepted alternate.
   f. Support boxes independently of raceways.
   g. Install adjustable steel channel fasteners for hung ceiling outlet box.
   h. Install stamped steel bridges to fasten flush-mounted outlet box between studs.
   i. Do not install boxes to ceiling support wires or piping systems.
7. Install partitions in multi-ganged boxes where different types of devices are installed, or devices installed operate at different voltages.
8. Mount boxes in block walls at block joint nearest to indicated height.
9. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

10. When boxes are installed in fire-resistive walls and partitions, provide 24" horizontal separation between boxes on opposite sides of a wall. In addition, limit penetrations to 16 sq in per penetration and not to exceed a total of 100 sq in per 100 sq ft of wall area. Apply fire stop putty pads acceptable to the fire marshal.
11. Pull and junction boxes: Install as shown, or as necessary to facilitate pulling of wire and to limit number of bends within code requirements. Install above accessible ceilings and in unfinished areas.
12. Install boxes to be permanently accessible.
13. Do not intermix conductors from more than one system in same junction box or pull box, unless shown or specifically authorized otherwise.
14. Adjust box location up to 10' prior to rough-in to accommodate intended purpose.
15. Orient boxes to accommodate wiring devices oriented as specified in Section 26 2726 – Wiring Devices.
16. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6" from ceiling access panel or from removable recessed luminaire.
17. The drawings do not necessarily show every outlet, pull or junction box required. Add all required boxes as necessary.

C. Floor Boxes:
1. Set metal floor boxes level and flush with finished floor surface.
2. Use cast floor boxes for installations in slab on grade.
3. Install floor boxes and fittings to preserve fire-resistant rating of slabs and other elements, using materials and methods specified in Section 26 0593 – Electrical Systems Firestopping.
4. Power and IT or AV conduits require a minimum 12" separation where routed parallel including entry into floor boxes.

D. Expansion Fittings:
1. Install raceway expansion and deflection fittings in all raceway runs embedded in or penetrating concrete where movement perpendicular to axis of the raceway may be encountered.
2. Install raceway expansion fittings complete with bonding jumpers in raceway runs that cross- expansion joints in structure and raceway runs mechanically attached to 2 separate structures.
3. Use couplings and flexible connection made up of 24" length of flexible metal conduit, where EMT runs across expansion joints in ceiling spaces.
4. Install fitting(s) that provide expansion and contraction for at least 0.0004" per ft of length of straight run per °F of temperature change.
5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation.

E. Raceway Penetration Seals:
1. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.
2. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway, using joint sealant appropriate for size, depth, and location of joint. Refer to Division 07 Section "Maintenance of Joint Protection" for materials and installation.
3. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway penetrations. Install sleeves and seal

with firestop materials. Comply with Section 26 0593 – Electrical Systems Firestopping.

4. Roof-Penetration Sleeves: Seal penetration of individual raceways with flexible, boot-type flashing units applied in coordination with roofing work.
5. Conduits may be directly cast into above grade concrete walls and slabs.
6. Aboveground, Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1” annual clear space between pipe and sleeve for installing mechanical sleeve seals.
7. Underground, Exterior-Wall Penetrations: Install cast-iron “wall pipes” for sleeves. Size sleeves to allow for 1” annual clear space between raceway and sleeve for installing mechanical sleeve seals.
8. Sleeve-Seal Installation: Use type and number of sealing elements recommended by manufacturer for raceway material and size. Position raceway in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
9. Provide chrome- or nickel-plated escutcheons where raceways pass through walls, floors or ceilings and are exposed in finished areas. Size escutcheons to fit raceways for finished appearance. Finished areas shall not include mechanical/electrical rooms, janitor’s closets, storage rooms, etc., unless suspended ceilings are specified.
10. Remove temporary sleeves, if used for form wall openings, prior to installation of permanent materials.

F. Raceway Sealing Fittings:
1. Install listed watertight seals to prevent the passage of moisture and water vapor through raceway, where raceway passes from interior to exterior of the building, where raceway passes between areas of different temperatures such as into or out of cold rooms or freezers, where raceway enters room which at any time is subject to low or high temperatures and where raceway enters a room which at any time is subject to internal air pressures above or below normal.
2. Install watertight seals in interior of all raceways passing through building roof, ground floor slab (when the raceway does not extend beyond building footprint), or through outside walls of building above or below grade. Seal on the end inside building, using raceway sealing fittings manufactured for the purpose. Locate fittings at suitable accessible locations. For concealed raceways install each fitting in flush steel box with blank cover plate to match finish of adjacent plates or surfaces.
3. Seal raceways entering or passing through “hazardous (classified) areas” as defined in NFPA 70.

G. Sleeve Installation for Electrical Penetrations:
1. Coordinate sleeve selection and application with selection and application of firestopping specified in Section 26 0593 – Electrical Systems Firestopping.
2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
3. Rectangular Sleeve Minimum Metal Thickness:
   a. For sleeve cross-section rectangle perimeter less than 50” and no side greater than 16”, thickness shall be 0.052”.
   b. For sleeve cross-section rectangle perimeter equal to, or greater than, 50” and 1 or more sides equal to, or greater than, 16”, thickness shall be 0.138”.

4. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies, unless openings compatible with firestop system used are fabricated during construction of floor or wall.
5. Cut sleeves to length for mounting flush with both surfaces of walls.
6. Extend sleeves installed in floors 2” above finished floor level.
7. Size pipe sleeves to provide 1/2” annular clear space between sleeve and raceway, unless sleeve seal is to be installed or unless seismic criteria require different clearance.

3.04 APPLICATION

A. Raceway uses permitted and not permitted per NFPA 70 requirements, OUSD Standards, and as described below. Raceways and cables not listed in this section are not permitted for use on campus.

B. RNC Raceways:
1. Above and below grade concrete encasements.
2. Below grade native or sand encasements.
3. In exposed corrosive areas (Schedule 80) with approval from the owner.
4. Not exposed or concealed above grade.

C. Rigid Metal Conduit (RMC) permitted to be installed as follows:
1. Installations below grade and in or under concrete slabs with corrosion protection tape
2. All transitions for below grade to above grade with 6” minimum embedment.
3. Pump HVAC and building equipment rooms.
4. Concealed in concrete or block encasements
5. Above grade in exposed locations
6. All locations except corrosive atmospheres
7. Hazardous locations
8. Locations requiring mechanical protection

D. Aluminum RMC
1. Food service areas.
2. Other areas approved or indicated on the drawings.

E. Electrical Metallic Tubing (EMT) permitted to be installed as follows:
1. Interior partitions
2. Above suspended ceilings
3. Exposed in telecom and electric rooms.
4. In labs and warehouses where installed above 10’ AFF.
5. Not used in outdoor, wet or damp locations.

F. Flexible Metal Conduit (FMC) permitted to be installed as follows:
1. Areas where a building finish will conceal this installation (wall, ceiling tile). Not exposed when building finishes are complete.
2. In lengths not to exceed 20’ between accessible junction or pull boxes.
3. No flexible metal conduit length restriction when using "Manufactured Wiring Systems."

G. Liquid Tight Flexible Metal Conduit (LFMC) permitted to be installed as follows:

1. Areas where will not be concealed by a building finish.
2. Concrete encasements.

H. Use liquid tight flexible conduit, 2 ft to 4 ft in length, for final connections to:
1. Vibrating equipment (including transformers and hydraulic, pneumatic, electric solenoid, or motor-driven equipment) in wet locations.
2. Instruments and control devices
3. Kitchen equipment

I. Stainless Steel Conduit
1. Use exposed stainless-steel conduit as directed on drawings.

J. One-half inch raceway permitted:
1. Between controller and its control or pilot device
2. Between lighting switch and nearest outlet for luminaire
3. Control wiring where mounted on equipment where conduit must follow contour of equipment
4. Protective and signal systems where noted.
5. Where shown on plans

3.05 RACEWAY WIRING METHODS

A. Underground:
1. Install rigid steel conduit or RNC with appropriate corrosion protection.
2. RNC – Schedule 40 PVC
3. Install concrete or poly-cast boxes of appropriate size.

B. In or Under Slab on Grade:
1. Install rigid steel conduit RMC with appropriate corrosion protection.
2. Install RNC and transition to RMC with 6” of embedment for above slab.
3. Cast metal floor boxes, plastic floor boxes with metal finish hardware to finish floor.

C. Outdoor Locations, Above Grade:
1. Install rigid steel conduit RMC
2. Install LFMC as required for equipment connections.
3. Install cast metal or nonmetallic outlet, pull, and junction boxes. Install flush mounting outlet boxes in finished areas.

D. Wet and Damp Locations:
1. Install rigid steel conduit RMC
2. Install cast metal or nonmetallic outlet, junction, and pull boxes. Install flush mounting outlet boxes in finished areas.
3. Install LEMC as required for equipment connections

E. Concealed Dry Locations:
1. Install electrical metallic tubing; install sheet metal boxes; install flush mounting outlet boxes in finished areas; install hinged enclosure for large pull boxes (above 24X24).
2. Install FMC where lengths between accessible pulling points does not exceed 20 feet.

F. Exposed Dry Locations (Classrooms, Laboratories, Offices, Hallways, Kitchens, Dorm Rooms, Restrooms, Gyms, Stairwell, Utility Rooms, etc.):
   1. Make every effort to conceal electrical infrastructure.
   2. Use “Surface Raceway” 26 05 33.13 for areas where concealment is not possible.
   3. LFMC for equipment connections that are hardwired.

G. Exposed Dry Locations (Workshops, Warehouses, Store Rooms, etc.):
   1. EMT at location 10” AFF.
   2. RMC at locations below 10’ AFF.
   3. LFMC for equipment connections that are hardwired.

H. Mechanical/ Electrical Rooms:
   1. RMC for mechanical rooms that have water piping in the same space.
   2. EMT for electrical rooms or mechanical rooms with no water piping.
   3. LFMC for equipment connections that are hardwired.

I. Corrosive Environments:
   1. Refer to the District for direction.

J. Foodservice Areas:
   1. Refer to the District for direction.

K. Exposed Subject to Damage:
   1. Install rigid steel conduit.

L. Hazardous Locations:
   1. Install rigid steel conduit; install cast metal boxes.

3.06 FIELD QUALITY CONTROL

A. Inspect raceway, boxes, indoor service poles, and wireways for physical damage, proper alignment, supports and seismic restraints, where applicable.

B. Replace any damaged component of the raceway system, or install new raceway system.

C. Inspect components, wiring, connections and grounding.

3.07 REPAINTING

A. Repair damage to galvanized finishes with manufacturer-supplied zinc-rich paint kit. Leave remaining paint with District’s Representative.

B. Repair damage to PVC or paint finishes with manufacturer-supplied touch-up coating. Leave remaining coating with District’s Representative.

C. Wireways, indoor service poles: Remove paint splatters and other marks from surface; touch-up chips, scratches, or marred finished to match original finish using manufacturer-supplied paint kit. Leave remaining paint with District’s Representative.

3.08 CLEANING

A. Clean interior and exterior of boxes, wireways, and indoor poles to remove dust, debris, and other material.

END OF SECTION

SECTION 260533.13 - SURFACE RACEWAY

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables

B. Section 26 05 26 – Grounding and Bonding for Electrical Systems

C. Section 26 05 53 – Electrical Systems Identification

1.02 REFERENCE

A. Work under this section is subject to the requirements of Contract Documents, including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

1.03 DESCRIPTION

A. The section includes the surface metallic raceway system for branch circuits and low-voltage wiring.

B. Surface raceway system shall consist of raceway bases, appropriate fittings, and device mounting plates necessary for a complete installation.

C. The lengths of the raceways shown on drawings are illustrative and diagrammatic only and are not accurate. Raceways shall be provided completely installed to match the lengths of cabinets and shelving as indicated on the laboratory casework shop drawings. Receptacle circuits shall be pre-wired.

1.04 REFERENCE STANDARDS

A. ANSI/NECA 1 – Standard Practices for Good Workmanship in Electrical Contracting

B. NFPA 70 – National Electrical Code

C. UL 5 - Surface Metal Raceways and Fittings

D. UL 5A - Nonmetallic Surface Raceways and Fittings

E. UL 94 – Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

1.05 SUBMITTALS

A. Product Data: Catalog cuts of components.

B. Shop Drawings:

1. Complete layout, with locations of raceway components.
2. Grounding, branch circuiting, and wiring including locations of service entrances.
3. Receptacle types, manufacturers, and spacing.
4. Receptacle labeling with proper voltage, phase, circuit and panelboard designations, as indicated on drawings.
5. Communication faceplate types, manufacturers, and labeling.

C. Manufacturer's Installation Instructions:

6. Indicate application conditions and limitations of use. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of the product.

D. Closeout Submittals:

7. Project Record Documents
   a. Record actual locations of surface raceways with receptacle types, locations, and circuits identified.
8. Operation and Maintenance Data:
   a. Include manufacturer's recommended operating instructions, maintenance procedures and intervals, and preventive maintenance instructions.
   b. Include spare parts data listing, source, and current prices of replacement parts and supplies.

1.06 QUALITY ASSURANCE

A. Obtain surface raceways from one source and from a single manufacturer.

B. Regulatory Requirements:

1. Comply with NFPA 70 for components and installation.
2. Furnished products listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store in a clean, dry space. Maintain factory-unopened packaging until ready for installation.

B. Comply with the manufacturer's written instructions.

1.08 WARRANTY

A. Refer to Division 01 and Section 26 00 00 – General Electrical Requirements for general warranty requirements.

B. The manufacturer shall provide a standard 1-year written warranty against defects in materials and workmanship for products specified in this Section. The warranty period shall begin on the date of substantial completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Metallic Raceways:

1. Hubbell
2. Legrand/Wiremold
3. Mono-Systems
4. Or equal

2.02 FABRICATION

A. UL 5, UL 5A, as applicable

B. Fabrication:

1. Aluminum
2. Suitable for use in dry interior locations only.
3. Two-piece with base and snap-on cover
4. Two or Three-compartment raceway with separate cover for each compartment.
5. Size as indicated on plans Two compartments - same size as Wiremold 4000 Series.
6. Covers with cutouts for device plates as shown on drawings.
7. 6” and 12” long device plates with flange to overlap joint of adjacent cover.

C. Prewired Raceways:

1. Wiring devices factory installed, wired, and covers labeled with panel number and circuit number, voltage, phase, and amperes, as identified on drawings, per requirements in Section 26 0519 – Low-Voltage Electrical Power Conductors and Cables.
2. Raceway sections with 12” pigtails at feed locations, in 2 ft minimum length and customized to match length shown on drawings.
3. Equivalent distance between receptacles; number of receptacles per length of raceway as shown on drawings.
4. Factory-installed, NFPA 70 sized grounding conductors, per requirements in Section 26 0526 - Grounding and Bonding for Electrical Systems.
5. Raceway covers with hole-cut provisions for communication outlets.
6. Wiring devices on top and communication outlets on the bottom.

D. Material:

1. Aluminum Raceways: Alloy 6063-T5 extruded aluminum, minimum thickness 0.060”
2. Fittings: Same material and metal thickness as linear raceway components.
3. Add steel raceways to spec, such as Wiremold Series 4000, 3000, 2000, 700, and 500.

E. Finish:

1. Aluminum Raceways:
   a. Electrostatically painted, refer to Architectural specifications for color.
2. Fittings: Color to match linear raceway components.
3. Add steel raceway to spec, such as Wiremold Series 4000, 3000, 2000, 700,

and 500.

F. Accessories:

1. Fittings: Available as standard accessories, including external corner units, internal corner units, flat units, blank end units, internal and external elbows, coupling for joining raceway sections, and device mounting brackets and plates.
2. Wire Clips: One for every 2 linear ft of indicated raceway configuration.
3. Corner elbows and tee fittings, to maintain 2" cable bend radius that meets requirements for communications pathways and specifications for fiber optic, coaxial, and high-performance twisted-pair cabling.
4. Device Mounting Brackets and Plates: Plastic device mounting brackets and trim plates allowing installation of indicated wiring devices, and communications outlets horizontally in raceways; trim cover sized to overlap device cut-out in raceway, concealing seams; finished to match linear raceway components; plastic compatible with UL 94; brackets and plates, to match raceway width, and with device mounting holes.

PART 3 - EXECUTION

3.01 COORDINATION

A. Coordinate cover plate openings with the wiring devices contained within.

B. Verify with manufacturer that 'touch-up' paint kit is available for repainting.

C. Coordinate surface raceways installation with (laboratory) casework shop drawings to match lengths of cabinets and shelving.

D. Verify location of raceways with architectural interior elevation drawings.

3.02 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect/Engineer of unsatisfactory preparation before proceeding.

3.03 INSTALLATION

A. Install in accordance with ANSI/NECA 1 and manufacturer's instructions.

B. Install flathead screws, clips and straps to fasten surface raceways to substrates, ensuring they are permanently and mechanically anchored. Double-sided adhesive is not acceptable. Mount plumb and level. Use suitable insulating bushings and inserts at connections to outlets and corner fittings.

C. Install wiring devices and communications outlets of type, quantity and spacing as indicated on drawings.

D. Mount raceways on wall and casework parallel to or at right angles to structure and casework.

E. Feed raceways mounted on walls casework from a backbox through a wall box connector. Determine point of feed in field and complete wiring connections.

F. Install a chase nipple extension between outlet box on wall and raceway when raceway mounted to support channel for modular casework.

G. Maintain ground continuity throughout entire raceway length per requirements in Section 26 05 26 – Grounding and Bonding for Electrical Systems.

H. Do not field cut prewired raceways.

I. Install appropriate backbox extension rings where raceway is mounted to steel slotted channel or by some other method, stood off from wall.

J. Raceway receptacle faceplates shall be labeled with adhesive labels with 1/4” high lettering, per requirements in Section 26 05 53 – Electrical Systems Identification, indicating receptacle voltage, phase, and amperage (i.e., 120V, 1-phase, 20A) at top of receptacle, and panel and circuit designation (i.e., NLP-D2-2/12) at bottom of receptacle, in accordance with requirements in Section 26 05 53 – Electrical Systems Identification, for 15A, 20A and 30A receptacles.

K. Reinforce each cover section for every 30A receptacle in raceway with two 4-40 Phillips counter- sunk steel screws attached to enclosure near top and bottom of receptacle.

L. Raceway base shall be secured using screws. Securing with double-sided adhesive is not acceptable.

3.04 FIELD QUALITY CONTROL

A. Inspect surface raceways for physical damage and proper alignment.

B. Inspect components, wiring, connections, installation, and grounding.

3.05 REPAINTING

A. Remove paint splatters and other marks from the surface of the equipment.

B. Touch-up chips, scratches, or marred finishes to match the original finish, using the manufacturer-supplied paint kit. Leave the remaining paint with the District’s Representative.

3.06 CLEANING

A. Vacuum dirt and construction debris from the interior and exterior of the equipment; do not use compressed air to assist in cleaning.

END OF SECTION

SECTION 260533.33 - OUTDOOR GROUND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 CONDITIONS AND REQUIREMENTS

A. The General Conditions, Supplementary Conditions, and Division 01 – General Requirements apply.

1.02 SECTION INCLUDES

A. Outdoor ground boxes.

1.03 RELATED SECTIONS

A. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables

B. Section 26 05 26 – Grounding and Bonding for Electrical Systems

C. Section 26 05 33 - Raceway and Boxes for Electrical Systems

1.04 SUBMITTALS

A. Product Data: Submit for outdoor ground boxes.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firms regularly engaged in the manufacture of outdoor ground boxes of the types and sizes required, whose products have been in satisfactory use in a similar service for not less than 10 years. Provide outdoor ground boxes produced by a manufacturer listed in this section.

B. Outdoor Ground Boxes: Comply with requirements of applicable local codes, NEC, UL, CSA, and NEMA Standards pertaining to outdoor floor boxes. Tested and listed by Underwriters Laboratories, Inc. to meet NEMA 6P and IP68 requirements for use in outdoor locations. Outdoor ground boxes comply with ADA guidelines, including unobstructed reach requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver outdoor ground boxes in factory-labeled packages.

B. Store and handle strictly in compliance with the manufacturer’s written instructions and recommendations.

C. Protect from damage due to weather, excessive temperature, and construction operations.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product: The design for outdoor ground boxes is based on Outdoor Ground Boxes manufactured by Legrand/Wiremold, 60 Woodlawn Street, West Hartford, CT 06110; toll-free 800-621-0049, telephone 860-233-6251, fax 860-232-2062; Website: www.legrand.us/wiremold.

B. Or equivalent.

2.02 OUTDOOR GROUND BOXES

A. Classification and Use: Outdoor ground boxes shall have been examined and tested by Underwriters Laboratories Inc. to meet NEMA 6P and IP68 requirements to be safe to use even during inclement weather and bear the cULus Listing Mark.

B. Outdoor Ground Boxes, General:

C. Outdoor ground boxes shall be designed to trap and maintain an air pocket to protect the devices, plugs and connections from water, snow, and ice. Boxes shall be constructed from UV rated chemical resistant materials. Boxes designed to ANSI/SCTE 77 with a Tier 5 rating to hold up to 5000 lbs of load. Boxes install flush to finished ground reducing tripping hazards. Box shall have a diving bell concept to maintain an air pocket and keep water away from connections. Box shall have an egress door that will auto-adjust to cable diameter and auto-lock in the closed position when no cables are exiting the box.

D. Model XB814 Exterior Ground Boxes: Single service 2-gang ground box manufactured from UV-rated nonmetallic material. Box accepts up to two 1-1/4" trade size PVC conduit feeds. Boxes are designed to be installed separately or ganged together for greater capacity and flexibility. Accepts optional XB814 cover assembly. Boxes shall be 16-1/8” L x 8-1/8” W x 10-3/4” H [410mm x 206mm x 273mm]. Box assemblies include the main box body, installation cap, and installation plate.

E. Model XB814C520 Exterior Box Cover Assembly 5-20R: Assembly prewired with two (2) 20A L5-20R weather-resistant duplex receptacles. Box assemblies shall be 16-1/8” L x 8-1/16” W x 10-3/4” H [410mm x 205mm x 273mm]. Cover assembly includes flange, cover, junction box, (2) 20A 5-20R receptacles, SOOW cord, wet location wire connectors, key, and mounting hardware.

F. Model XB814CL530 Exterior Box Cover Assembly L5-30R: Assembly prewired with one (1) 30A L5-30R 120V corrosion-resistant duplex receptacle. Cover assemblies shall be 16-1/8” L x 8-1/16” W x 10-3/4” H [410mm x 205mm x 273mm]. Cover assembly includes flange, cover, junction box, SOOW cord, L5-30R receptacle, wet location wire connectors, key, and mounting hardware.

G. Model XB814CL630 Exterior Box Cover Assembly L6-30R: Assembly prewired with one (1) 30A L6-30R 240V corrosion-resistant duplex receptacle. Cover assemblies shall be 16-1/8” L x 8-1/16” W x 10-3/4” H [410mm x 205mm x 273mm]. Cover assembly includes flange, cover, junction box, SOOW cord, L6-30R receptacle, wet location wire connectors, key, and mounting hardware.

H. Model XB814CLV Exterior Box Cover Assembly Low Voltage: Assembly designed to accept up to 12 communication ports or eight (8) Legrand AVIP devices. Cover assemblies shall be 16-1/8" L x 8-1/16" W x 10-3/4" H [410mm x 205mm x 273mm]. Cover assembly includes flange, cover, junction box, corrugated conduit assembly, (1) 12-port communication mounting plate, (1) 8-port Legrand AVIP audio/video mounting plate, key, and mounting hardware.

2.03 ACCESSORIES

A. Model XB814CP Exterior Box Cover Plate Kit: Replacement cover plate including new handle and required mounting hardware.

B. Model XB814ED Replacement Egress Door Kit: The Replacement door can be changed out if the door ever wears out or becomes damaged.

C. Model XB814SP Replacement Egress Door Spring Pin Set: Locks egress door in the closed position when cover is closed.

D. Model XBLNT Exterior Box Locknut Tool: Exterior box locknut wrench; used to tighten the locknut on the junction box.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine conditions under which outdoor ground boxes are to be installed. Notify the [Architect/Engineer] [Construction Manager] in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Strictly comply with manufacturer's installation instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances and to prevent electrical hazards.

3.03 CLEANING AND PROTECTION

A. Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer.

B. Protect boxes until acceptance.

END OF SECTION

SECTION 260543 - UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included

1. Furnishing, installation, and connecting of path lights, track lights, conduits and fittings, conductors, boxes, enclosures, ground rods, and accessories.
2. Trenching, excavation, and backfilling for all underground conduits and pull boxes.
3. Concrete work pole lights.

1.02 DESCRIPTION

A. Section 26 01 00 - General Electrical Requirements

B. Technical Requirements

1.03 SEPARATION FROM OTHER SERVICES

A. Separate conduit runs not less than one foot horizontally and one six inches vertically from water lines.

1.04 STANDARD PRACTICES

A. Installation of conduits shall be in accordance with the latest edition of the NEC.

PART 2 - PRODUCTS (Refer to Electrical Drawings)

PART 3 - EXECUTION

3.01 EXCAVATION

A. Excavations shall be open vertical construction of sufficient width to provide free working space around the work and to provide sufficient space for backfill and tamping.

B. Provide safety shoring, bracing, or bulk-heading to support excavations and maintain warning signs and barricades. Provide suitable temporary steel covers over excavations crossing roadways or walks.

C. Excavate all trenches so that minimum coverage above conduit to finish grade is not less than 18" in planted areas, and 24” under roads, unless otherwise specified or as shown on Drawings.

D. For non-metallic conduits in planted areas shall be placed on a bed of sand or select clean and rock-free native material.

E. Keep excavations free of water.

3.02 BACK FILLING

A. Cover non-metallic conduits a minimum 3" layer of sand or select clean rock-free native material. Compaction of the backfill shall be per the Site Work specifications.

B. Except where sand or select fill is required as specified above and except under paved areas, walks or roads, use backfill of suitable excavated material with 2" maximum rocks or clods. If excavated material is unsuitable or inadequate for the backfill as specified furnish and import additional suitable materials to complete the work.

C. Compact the fill by adding backfill material in 8" maximum layers and tamping by hand or machine. Do not machine-tamp first backfill layer over non-metallic conduits or ducts not concrete encased.

D. Remove shoring as backfill is placed. Remove from property surplus material remaining after back filling, or place as directed by Owner’s Representative.

E. Replace existing road, walkway, pavement, or similar surfaces, to match existing, and as indicated on Drawings.

F. Bring to grade any subsidence occurring during the Guarantee Period by adding surfacing materials of the like kind.

3.03 PULLBOXES AND HANDHOLES

A. In underground boxes, place duct and conduit entries using the knockout panels provided. Pour concrete around conduits to anchor them in place.

B. Provide End Bells at all PVC conduit entrances where indicated on drawings.

C. Install boxes and handholes flush with grade or pavement. In pavement use, boxes with covers that are traffic-rated. In landscape areas, use reinforced concrete covers. All covers shall be marked "Electric" or as required to suit.

D. Handholes shall have as a minimum one base section and one 12" riser, set on a minimum 6" bedding of pea-gravel.

3.04 RACEWAYS

A. Install conduit runs generally straight and true between pull boxes.

B. Slope conduit runs 6" minimum per 100 feet to avoid possibility of pockets that could accumulate water. Double-slope grading of conduits from midpoint of run is permitted.

C. Make the bend radius to the centerline of all conduits not less than 10 times the nominal diameter of the conduit.

D. Rod all underground raceways with approved flexible mandrels and brushes to remove all obstructions and to prove that raceways are clear and usable.

E. Furnish and install pull lines in all empty raceways. The pull line shall be continuous from pull box to pull box, with 24" of slack left at each termination.

3.05 ASPHALT PAVING REPLACEMENT

A. Where the trench for the conduit is in an improved street, the area shall be restored in accordance with the plans.

3.06 TRENCHING AND BACKFILL

A. Where the trench for the conduit is in an improved street, the backfill shall use controlled flow low-density concrete as shown on the plans, with asphalt concrete pavement.

3.07 HORIZONTAL DIRECTIONAL BORING

A. Contractor shall have the option of using either open-cut trenching or horizontal directional drilling for the installation of underground conduits.

B. Horizontal directional drilling shall include the use of mechanical and hydraulic deviation equipment to allow for changing the direction of the boring course at any point during the operation. The equipment shall include instruments capable of monitoring the exact location of the drilling head assembly. The equipment shall be able to create and direct the bore-hole along a predetermined path to the specified target location.

C. Horizontal directional drilling shall be done with fluid-assisted mechanical cutting. Drilling fluids shall be as recommended by the equipment manufacturer. Contractor shall be responsible for regulating pressure and flow rates so that compaction of the surrounding sub-grade materials around the bore is not altered.

D. Uncontrolled jetting (using fluid force to erode the soil) is prohibited. Any area where sub-grade and/or aggregate base compaction has been damaged by boring shall be repaired at the Contractor’s expense, and to the satisfaction of the Owner. Repair work shall include removal and replacement of surface paving at the Contractor's expense, if required for proper sub-grade and/or aggregate base compaction.

E. Mobile horizontal directional drilling system shall be capable of being started at the existing finish grade at an inclined angle to achieve required depth. The equipment shall be able to drill a 2" to 3" diameter pilot hole to a distance of 200', or greater to suit job conditions. The drill head assembly shall utilize small diameter fluid jets to fracture along with mechanical cutters to bore and excavate soil as the head advances. The pilot hole is to be enlarged with reamers as required and the line pulled into the hole with fluid mixtures in accordance with the equipment

manufacturer's directions.

PART 4 – MEASUREMENT AND PAYMENT

4.01 All work under this section shall be paid for at the lump sum price bid for site electrical and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in site electrical and related incidental work.

END OF SECTION

SECTION 260553 - ELECTRICAL SYSTEMS IDENTIFICATION

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables

B. Section 26 05 33 – Raceways and Boxes for Electrical Systems

C. Section 26 05 43 – Underground Ducts and Raceways for Electrical Systems

D. Section 26 09 23 – Lighting Control Devices

E. Section 26 22 00 – Low-Voltage Transformers

F. Section 26 24 16 – Distribution Panelboards

G. Section 26 43 00 – Surge Protection Devices

H. Section 26 56 00 – Exterior Lighting

1.02 REFERENCE

A. Work under this Section is subject to requirements of Contract Documents, including General Conditions, Supplementary Conditions, and sections under Division 01 - General Requirements.

1.03 DESCRIPTION

A. Section includes the following:

1. Identification for raceway and metal-clad cable
2. Identification for conductors and communication and control cable
3. Underground line warning tape
4. Warning labels and signs
5. Instruction signs and posted drawings
6. Equipment identification nameplates
7. Wiring devices identification
8. Miscellaneous identification products

B. Refer to the respective Electrical Division 26 Sections, and Sections in other Divisions that specify electrical components, for additional electrical identification requirements.

1.04 REFERENCE STANDARDS

A. ANSI A13.1 – Scheme for the Identification of Piping Systems

B. ANSI C2 – National Electrical Safety Code

C. ANSI Z535.4 – National Standards for Product Safety Signs and Labels

D. 29 CFR – Labor, Part 1910 – Occupational Safety and Health Standards, Section 1910.145 – Specifications for Accident Prevention Signs and Tags

E. NFPA 70 – National Electrical Code

1.05 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Nameplate Schedule: Prior to making nameplates, submit a complete schedule to Architect for approval indicating nameplate size, lettering size, color and actual nameplate information.

C. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.

1.06 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and ANSI C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.145.

1.07 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

1.08 DESIGN STANDARDS

A. Submittals:

1. Provide a sample of all label type for the particular project to the owner for approval prior to the execution of any label or identification placement.
2. Identification of power receptacles, equipment disconnects and other utilization devices and equipment.
3. Provide a thermoplastic engraved legend, white background with black

letters that denotes the panel designation and circuit designation per below example: LA/2,4,6.
Where “LA” is the panel designation and “2,4,6” is the circuit designation.

4. Minimum size for power receptacles is .5” high by 1.5” wide with .25” letters.
5. Affix to the device using 30 year silicone adhesive.

B. Labels for Junction and Pull Boxes
   1. Exposed locations: Provide a thermoplastic engraved legend with white letters on a black background indicating the contents, panel numbers and circuit numbers of conductors and equipment in the box. Use 30 year silicon adhesive to attach legend to the box.
   2. Concealed locations: Write legibly from a distance of 15 feet on the box with an indelible ink marker as the contents, panel numbers and circuit numbers of the conductors and equipment in the box.

C. Circuit Directories
   1. Circuit Directories are to be installed in a permanent enclosure on the inside of the door of the equipment that they are in reference to.
   2. Circuit Directories are to be neatly typed and include the panel designation, date and the source of electricity for the panel.
   3. Circuit directories are to provide enough description of each load or circuit such that an operator can distinguish a particular load in questions from all other loads in the panel without the use of a circuit tracer or similar tools. Provide a map or diagram with directory if appropriate.

D. Wire Identification
   1. All wires are to be installed in their corresponding phase colors. See below in section 3.02 Installation.
   2. Panel connections will have circuit number tape on the ungrounded phase conductors to indicate their specific circuit number.
   3. Panel connections will have circuit number tape on the grounded conductors (neutrals) to indicate their specific circuit numbers.

E. Other Electrical Identification
   1. All VFD, Lighting Controllers, Relay Cabinets and thermoplastic engraved legend with white letters on black background indicating the equipment designation. Use 30 year silicon adhesive to attach legend.
   2. All power outlets, power disconnects and lighting switches will have an engraved plastic legend indicating their feed panel and circuit number. Glue the engraved legend in place with silicone.

PART 2 - PRODUCTS

2.01 RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Manufacturers: Brady USA, Ideal, Marking Services, Inc. (MSI), Seton, or approved

equal.

C. Color for Printed Legend:
   1. Power Circuits: Black letters on an orange field.
   2. Legend: Indicate system or service and voltage, if applicable.

D. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical- resistant coating and matching wraparound adhesive tape for securing ends of legend label.

E. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action when placed in position.

F. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2” long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action when placed in position.

2.02 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend.

B. Manufacturers: Brady USA, Ideal, Marking Services, Inc. (MRI), Seton, or equal.

C. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

D. Aluminum Wraparound Marker Labels: Cut from 0.014” thick aluminum sheet, with stamped, embossed, or scribed legend, and fitted with tabs and matching slots for permanently securing around wire or cable jacket or around groups of conductors.

E. Metal Tags: Brass or aluminum, 2” x 2” x 0.05”, with stamped legend, punched for use with self- locking nylon tie fastener.

F. Write-On Tags: Polyester tag, 0.015” thick, with corrosion-resistant grommet and polyester or nylon tie for attachment to conductor or cable.
   1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

G. Plasticized Card-Stock Tags: Vinyl cloth with preprinted and field-printed legends. Orange background, unless otherwise indicated, with eyelet for fastener.

2.03 UNDERGROUND-LINE WARNING TAPE

A. Manufacturers: Ideal, Marking Services, Inc. (MRI), Seton, or approved equal.

B. Description: Permanent, bright-colored, continuous-printed, polyethylene tape.
   1. Not less than 6” wide by 4 mils thick.
   2. Compounded for permanent direct-burial service.
   3. Embedded continuous metallic strip.
   4. Printed legend shall indicate type of underground line.
   5. Red tape for electrical and orange tape for communications installations.

2.04 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory printed, multicolor, pressure-sensitive

adhesive labels, configured for display on front cover, door, or other access to equipment, unless otherwise indicated.

C. Self-Adhesive Arc Flash Warning Labels: Industrial grade, made of durable polyester with over- laminate to withstand harsh environments (UV rays, scratches and most chemicals).
   1. Manufacturer: Seton or approved equal

D. Engraved Plastic Signs: Engraving stock, melamine plastic laminate, minimum 1/16" thick for signs up to 20 sq in and 1/8" thick for larger sizes.
   1. Engraved legend with black letters on white face.
   2. No punched or drilled mechanical fasteners are permitted
   3. Color schemes is as follows:
      a. Normal: black background with white letters
      b. Emergency: red background with white letters
      c. Standby: yellow background with black letters
      d. Fire alarm: red background with yellow letters
      e. Communication: orange background with white letters

E. Baked-Enamel Warning Signs for Interior Use: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application. 1/4" grommets in corners for mounting. Nominal size, 7" x 10".

F. Metal-Backed, Butyrate Warning Signs for Exterior Use: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396" galvanized-steel backing; and with colors, legend, and size required for application. 1/4" grommets in corners for mounting. Nominal size, 10" x 14".

G. Warning label and sign shall include, but are not limited to, the following legends:
   1. Multiple Power Source Warning: "DANGER – ELECTRICAL SHOCK HAZARD – EQUIPMENT HAS MULTIPLE POWER SOURCES."
   2. Workspace Clearance Warning: "WARNING – OSHA REGULATION – AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."
   3. Arc Flash Labels: Per ANSI Z535.4, the signal word WARNING appearing in black letters on an orange background, with second line below (Arc Flash and Shock Hazard) in black letters on white background and third line below (Appropriate PPE Required) in black letters on white background. Include the following information on the label:
      a. Equipment name
      b. Available bolted current
      c. Flash protection boundary distance
      d. Incident energy level at 18" expressed in cal/cm^2
      e. Personnel protective equipment (PPE) class
      f. Voltage shock hazard
      g. Limited shock approach boundary
      h. Restricted shock approach boundary
      i. Prohibited shock approach boundary

2.05 INSTRUCTION SIGNS AND POSTED DRAWINGS

A. Instruction Signs: Engraved, laminated acrylic or melamine plastic, minimum 1/16" thick for signs up to 20 sq in and 1/8" thick for larger sizes.

1. Engraved legend with black letters on white face.
2. Punched or drilled for mechanical fasteners.
3. Mounting Frames: Extruded aluminum, 4-point screw mount with 1/8" clear plexiglass cover.

B. Posted Drawings: Print electrical riser diagrams on 20 lb bond paper. (Blueprint paper is not acceptable.) Reduce drawings to approximately 1/2 size using Xerox reduction process. Contact Engineer to obtain updated original plans for printing.

2.06 EQUIPMENT IDENTIFICATION NAMEPLATES

A. Engraved, Three-layer, Laminated Acrylic or Melamine Nameplate: Punched or drilled for screw mounting. Minimum letter height shall be 3/8" unless noted otherwise.

B. Color schemes to be as follows:
   i. Typical u.n.o. below: black background with white letters
   ii. Emergency: red background with white letters
   iii. Standby: yellow background with black letters
   iv. Fire alarm: red background with yellow letters
   v. Communication: orange background with white letters

2.07 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, type 6/6 nylon cable ties.
   1. Minimum Width: 3/16"
   2. Tensile Strength: 50 lb minimum
   3. Temperature Range: -40°F to 185°F
   4. Color: Black, except where used for color-coding

B. Paint: Paint materials and application requirements are specified in Division 09 – Finishes painting Sections.

C. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws
   with nuts and flat and lock washers.

PART 3 - EXECUTION

3.01 APPLICATION

A. Accessible Raceways, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30A: Identify with orange [self-adhesive vinyl labels.
   1. Identify 4" round, 4" square and 4-11/16" junction boxes concealed above ceiling or exposed with neat lettering on cover with permanent black marking pen. Identify source, circuit number, phase, and control circuit number.

B. Conductors to Be Extended in the Future and Spare Conductors: Attach write-on tags to conductors and list source and circuit number.

C. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable. Install

underground-line warning tape for both direct-buried cables and cables in raceway.

D. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply self-adhesive warning labels. Identify system voltage with black letters on an orange background. Apply to the exterior of the door, cover, or other access to the equipment.
   1. Equipment with Multiple Power or Control Sources: Apply to the door or cover of equipment, including, but not limited to, the following:
      a. Power transfer switches
      b. Controls with external control power connections
   2. Equipment Requiring Workspace Clearance According to NFPA 70: Unless otherwise indicated, apply to door or cover of equipment but not on flush panelboards and similar equipment in finished spaces.
   3. Arc Flash Warning Labels: install per NFPA 70 for each switchgear, switchboard, panelboard, motor control center, industrial control panel (every enclosure that may contain energized conductors or components). Locate labels so they are visible to the personnel before examination, adjustment, servicing, or maintenance of the equipment.
   4. Available Fault Current Labels: install per NFPA 70 for each piece of service entrance equipment. Locate labels so they are visible to the personnel before examination, adjustment, servicing or maintenance of the equipment.

E. Instruction Signs and Posted Drawings:
   1. Operating Instructions: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend printed in all capital letters of 12 pt size minimum where instructions are needed for system or equipment operation.
   2. Emergency Operating Instructions: Install instruction signs with white legend on a red background with minimum 3/8” high letters for emergency instructions at equipment used for power transfer.

F. Emergency Electrical System Junction and Pull Boxes:
   1. Identify with spray-painted covers as follows:
      a. 480/277 V circuits: Red/Brown
      b. 120/208 V circuits: Red/White
   2. Confirm with owner’s representative for boxes located in concealed areas.

G. Equipment Identification Nameplates: On each unit of equipment, install unique designation nameplate that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply nameplates to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
   1. Nameplate Instructions:
      a. Indoor Equipment: Engraved, laminated acrylic or melamine nameplate. Unless otherwise indicated, provide a single line of text with 1/2” high letters (1/4” where space is limited) on 1-1/2” high nameplate; where 2 lines of text are required, use nameplates sized 2” high.
      b. Outdoor Equipment: Engraved, laminated acrylic or melamine nameplates sized similar to indoor equipment nameplates
      c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
   2. Install nameplates for equipment including, but not limited to, the following:

a. Panelboards, electrical cabinets, and enclosures
b. Access doors and panels for concealed electrical items
c. Electrical switchgear, switchboards, and distribution panelboards including each feeder device within the equipment enclosures.
d. Transformers
e. Remote-controlled switches, dimmer modules, and control devices
f. Battery inverter units
g. Provide the following information on each nameplate:
h. Equipment name/tag:
   1) Matching the designation from the contract documents, or identifying the load controlled or function of the equipment, where no specific tag is shown on the contract documents.
   2) For disconnect switches, use the prefix “SW-” followed by the name of the equipment served, example: “SW-PMP-201.”
i. Equipment operating voltage, phase, wiring configuration, and ampacity:
   1) Example: 208V/3PH/4W/225A”
j. Source of power supply, including circuit number:
   1) Example: “FED FROM LP-2/45”

H. For service entrance equipment, provide a nameplate identifying the maximum available fault current and “as of” effective date.
   1. Example: “MAXIMUM AVAILABLE FAULT CURRENT 33,500A AS OF 2017/06/15.”

I. Access Panel Identification: Furnish typewritten charts with identification and location of access panels serving equipment and incorporate in O&M Manuals.

3.02 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Install non-adhesive signs and plastic nameplates parallel to equipment lines; attach with screws and auxiliary hardware appropriate to the location and substrate. Secure to inside surface of door or panelboard that is recessed in finished locations.

F. Posted Drawings and Operating Instructions: Mount drawings and operating procedures on the wall immediately adjacent to the piece of equipment for which the instructions apply. If sufficient wall space is available, mount directly to one of the sheet metal panels of the equipment.

G. Warning Signs: Install warning signs where there is hazardous exposure or danger associated with access to or operation of electrical facilities. Provide text of sufficient clarity and lettering of sufficient size to convey adequate information at each location; mount permanently in an appropriate and effective location. Comply with ANSI A13.1 standard color and design.
   1. Operational Tags: Where needed for proper and adequate information on operation and maintenance of electrical systems, provide tags of plasticized card stock, either preprinted or hand printed to convey the message; example:

"DO NOT OPEN THIS SWITCH WHEN BREAKER IS CLOSED."

H. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50 ft maximum intervals in straight runs, and at 25 ft maximum intervals in congested areas.

I. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder, and branch-circuit conductors.

1. Colors for 208/120 V Circuits:
   a. Phase A (left bus in panelboard): Black
   b. Phase B (center bus in panelboard): Red
   c. Phase C (right bus in panelboard): Blue
   d. Neutral: White
      1) Dedicated neutral, Phase A: white with black tracer
      2) Dedicated neutral, Phase B: white with red tracer
      3) Dedicated neutral, Phase C: white with blue tracer
   e. Equipment Ground: Green
2. Colors for a 240V 3 Phase System:
   a. Phase A: Black
   b. Phase B: Purple
   c. Phase C: Blue
3. Colors for a 240/120V Single Phase Systems:
   a. Phase A: Black
   b. Phase B: Red
   c. Neutral: White
4. Colors for 480/277 V Circuits:
   a. Phase A (left bus in panelboard): Brown
   b. Phase B (center bus in panelboard): Orange
   c. Phase C (right bus in panelboard): Yellow
   d. Neutral: Gray
      1) Dedicated neutral, Phase A; gray with brown tracer
      2) Dedicated neutral, Phase B: gray with orange tracer
      3) Dedicated neutral, Phase C: gray with yellow tracer
   e. Equipment Ground: Green
5. Where dedicated neutrals are required or are shown on the drawings, neutral insulation color shall be either white or gray with colored tracer to match color of phase conductor to which neutral is dedicated.
6. All conductors will be manufactured in their corresponding phase color identifiers. The use of phase tape or other means in not acceptable.

J. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6" to 8" below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16" overall.

END OF SECTION

SECTION 260923 - LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 26 00 00 - General Electrical Requirements

B. Section 26 56 00 - Exterior Lighting

1.02 REFERENCE

A. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

1.03 DESCRIPTION

A. Provide devices such as wall box dimmers, wall and ceiling mounted occupancy sensors, ambient light sensors, sensor power packs, etc., as shown on drawings.

B. Openings shall be covered with devices and matching plates.

C. Devices of same type shall be from same manufacturer.

1.04 REFERENCE STANDARDS

A. UL20 - General Use Snap Switches.

B. UL773A - Non-Industrial Photoelectric Switches for Lighting Control.

C. UL924 - Emergency Lighting and Power Equipment

D. NEMA WD 7 - Occupancy Motion Sensors.

E. NEMA IP - Ingress Protection Rating

F. California Building Energy Efficiency Standards

G. California Title 20 Appliance Efficiency Database

1.05 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings shall include:
1. Bill of material
2. Schematic diagrams
3. Suggested manufacturer layouts of all devices including overlays of product range.

C. Samples: One for each type of device and wall plate specified, in each color specified upon request.

D. Manufacturer's Installation Instructions:
   1. Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

E. Test Reports: Indicate field test and inspection procedures and interpret test results and corrective action taken for compliance with specification requirements.

F. Closeout Submittals:
   1. Project Record Documents:
      a. Record actual locations and type of devices.
   2. Operation and Maintenance Data:
      a. I Include in manufacturers' packing label warnings and instruction manuals with labeling conditions.
      b. Include source and current prices of replacement parts and supplies.

1.06 QUALITY ASSURANCE

A. Obtain devices from one source and by single manufacturer.

B. Regulatory Requirements:
   1. Comply with NFPA 70 for components and installation.
   2. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and indicated.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store in clean, dry space. Maintain factory unopened packaging until ready for installation

1.08 WARRANTY

A. Refer to Division 01 and Section 26 00 00 – General Electrical Requirements for general warranty requirements.

B. Manufacturer shall provide standard 1-year warranty against defects in materials and workmanship for products specified in this Section. Warranty period shall begin on date of substantial completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Manufacturer (Per OUSD standard): Wattstopper is the preferred onsite standalone lighting control system for following lighting control devices
   1. Wall Box Dimmers

2. Low Voltage Switches
3. Sensors and Power Packs
4. Exterior Occupancy Sensors
5. UL 924 Emergency Bypass/Control Device
6. Exterior Photocells
7. Self-Contained Automatic Timer Switches
8. Line voltage devices when approved for use:
    a. Ceiling mounted occupancy sensor
    b. Wall mount line voltage dimming
    c. Intermatic time clock and photocell to be approved by campus.

B. It is the responsibility of Electrical Contractor to ensure devices submitted meet or exceed functional intent and design quality standards.

2.02 FABRICATION AND MANUFACTURE

A. Devices shall be UL listed for loads and voltages as indicated in contract drawings and specifications.

B. Devices shall comply with CA Title 20 Appliance Efficiency Regulations.

2.03 WALL BOX DIMMERS

A. Dimmers shall:
1. Operate in ambient temperature range of 32°F to 104°F.
2. Be linear slide or pushbutton preset or programmable dimmers with power-failure memory.
3. Incorporate separate control of intensity and ON/OFF.
4. Include voltage compensation circuitry that adjusts firing angle of dimmer to compensate light output for variations in AC line voltage. Dimmers in which firing angle is held constant with varying AC line voltage shall not be acceptable.
5. Provide smooth and continuous IESNA Square Law Dimming Curve throughout entire dimming range.
6. Incorporate filter network to minimize interference (RFI) with radio, audio, and video equipment.
7. Incorporate air-gap switch to meet requirements of UL 20 for air-gap switches in incandescent dimmers.

B. LED dimmers shall:
1. Be approved for use with luminaire and driver.
2. Provide smooth non-flicker dimming of controlled luminaires.
3. Be 0-10V type, unless noted otherwise on drawings.
4. Provide at least 10 steps for continuously dimmed luminaires.
5. Refer to Section 26 56 00 – Exterior Lighting for solid state dimming ballast/driver specification.

2.04 LOW -VOLTAGE SWITCHES

A. Low voltage switches shall:

1. Mount in a single or double gang box.
2. Be capable of multi-way switching.

2.05 OCCUPANCY AND VACANCY SENSORS

A. Sensors shall:
1. Operate with all lamp and ballast combinations; including magnetic, hybrid, and solid- state ballasts/drivers.
2. Operate with ultrasonic, microphonic, passive infrared or presence technologies as indicated on drawings.
3. Have visible LED to indicate occupant detection.
4. Have adjustable time delay with a maximum setting of 30 minutes and adjustable sensitivity.
5. Contain isolated relay, or remote relay with normally open, normally closed, and common outputs for use with HVAC system, data logging, controlled receptacles or other system control options where indicated in the contract documents.
6. Be provided with ceiling, wall or wall switch style mounting as indicated on drawings.
7. Have daylight filter to ensure PIR sensor is insensitive to short-wavelength waves emitted by the sun.
8. Incorporate by-pass switch to enable lighting to be turned on if sensor fails.
9. Be low voltage wired in parallel to common power pack, where applicable

B. Occupancy Sensors shall:
1. Provide automatic ON, automatic OFF operation where indicated on drawings.

C. Vacancy Sensors shall:
1. Provide manual ON, automatic OFF operation where indicated on drawings.

D. Partial-ON Occupancy Sensors shall:
1. Provide automatic ON for a portion of the luminaires within a space and automatic OFF for all luminaires within a space were indicated on drawings. The additional luminaires within a space will be controlled ON manually but will be forced OFF when occupancy is not detected.

E. Partial-OFF Occupancy Sensors shall:
1. Provide manual ON, automatic OFF for a portion of the luminaires within an area where indicated on drawings.

2.06 AMBIENT LIGHT SENSORS

A. Ambient light sensors shall:
1. Incorporate photoconductive cell to measure light levels between 1 and 1,000 footcandles.
2. Be adjustable with deadband feature to prevent cycling of lighting from minor changes in cloud cover.
3. Have adjustable time delay range from 3 to 5 minutes.
4. Not permit lighting systems to be turned on if enough daylight is present.
5. Incorporate by-pass switch to enable lighting to be turned on if sensor fails.

2.07 POWER PACKS

A. Sensor power packs shall
   1. Be self-contained transformer relay modules.
   2. Have universal rated voltage inputs 120-277 VAC, 60 Hz.
   3. Have normally closed dry contacts rated for switching 120-277 volts, 60 Hz. 20-amp loads. Provide 24VDC output capable of controlling low-voltage occupancy sensors.

2.08 EXTERIOR OCCUPANCY SENSORS

A. Exterior occupancy sensors shall:
   1. Be a completely self-contained device capable of detecting presence in the controlled range by detecting changes between infrared energy in motion and the background space.
   2. Utilize passive infrared detection technology and a three level Fresnel lens to increase detection density and accuracy of motion detection.
   3. Be capable of mounting vertically or horizontally onto a standard outdoor junction box or integral to exterior luminaires.
   4. Cover up to 35 ft with a field of view of 180 degrees or 52.5 ft with a field of view of 270 degrees.
   5. Have an operating temperature range of -40°F to 130°F.
   6. Be IP66 rated for outdoor applications.
   7. Include a built-in light level sensor, adjustable by the user that will keep lights from turning on during daylight hours.
   8. Have user-adjustable time delay settings, including an override ON option that enables controlled lights to be turned on remotely for the length of the time delay.
   9. Be compatible with all electronic ballasts and LED drivers with no minimum load requirements.

2.09 UL 924 EMERGENCY BYPASS/CONTROL DEVICES

A. UL 924 listed bypass relays shall:
   1. Be UL924 listed and labeled for connection to both normal and emergency lighting power sources.
   2. Have universal rated voltage inputs 120-277 VAC, 60 Hz.
   3. Have normally closed dry contacts rated for switching 120-277 volts, 60 Hz. 20-amp loads.
   4. Have integral manual test switch.
   5. Have auxiliary isolated normally closed contact for connection to remote test switch, fire alarm system, or other external system capable of providing a normally closed dry contact closure.
   6. Have status indication for presence of normal and emergency power sources and current operational mode (normal or emergency).
   7. Utilize zero crossing circuitry to protect relay contacts from the damaging effects of inrush current generated by switching electronic ballast loads.
   8. Be forced into the emergency mode upon loss of normal power sense and turn ON the emergency lighting.
   9. Automatically switch emergency lighting ON/OFF as normal lighting is switched. When normal power is not available, the unit shall force and hold emergency

lighting ON regardless of the state of any external control device until normal power is restored.

B. Operational temperature range shall be -40°F to 140°F.

C. Devices shall have universal mounting; surface, above suspended ceiling or recessed.

2.10 EXTERIOR PHOTOCELLS

A. Photocells shall:
1. Have universal rated voltage inputs 120-277 VAC, 60 Hz.
2. Be rated for up to 2,000 watts.
3. Have cadmium sulfide, 1” diameter cell.
4. Have SPST normally closed contacts.
5. Have a minimum delay of 3 minutes to prevent false switching.

B. ON/OFF adjustment shall be done by moving light selector with range from 2 to 50 footcandles.

C. Operational temperature range shall be -40°F to 140°F.

D. Enclosure shall be die cast zinc, gasketed for maximum weatherproofing.

E. Enclosure shall include positioning lug on top.

F. Mounting shall be for 1/2” conduit nipple.

2.11 SELF-CONTAINED AUTOMATIC TIMER SWITCHES

A. Timer switches shall:
1. Have universal rated voltage inputs 120-277 VAC, 60 Hz.
2. Be programmable to turn lights OFF after a preset time.
3. Have a ground wire and ground strap for safety with a latching air gap relay switching mechanism.
4. Use Zero Crossing Circuitry to increase the relay life, protect from the effects of inrush current.
5. Be compatible with all electronic ballasts, motor loads, LEDs and LED drivers, compact fluorescent and inductive loads. Triac and other harmonic generating devices shall not be allowed.
6. Have no minimum load requirement and shall be capable of controlling 0 to 800 watt incandescent, fluorescent @ 100/120 VAC, 50/60 Hz; 0 to 1200 watts fluorescent @ 230/277 VAC, 50/60 Hz; 1/6 hp @ 125 VAC. LED with internal or external driver@ 100/120VAC.
7. Have the option for light flash warning at five minutes before the timer runs out and again when the countdown reaches one minute.
8. Have the option for a beep warning that shall sound every five seconds once the time switch countdown reaches one minute.
9. Have manual feature for timer reset where pressing the ON/OFF switch for more than 2 seconds resets the timer to the programmed time-out period.
10. Have a feature that shows the timer’s countdown.

11. Have the calibration switch for setting time-out, time scroll, one second light flash, and beep warning shall be concealed to prevent tampering of adjustments and hardware.
12. Have a maximum allowed over-ride period no greater than 2 hours.
13. Be capable of operating as an ON/OFF switch.
14. Utilize terminal style wiring.
15. Have a 100% OFF override switch with no leakage current to the load.

2.12 FINISHES

A. Color:
   1. Wall box dimmers, low-voltage switches, occupancy sensors, ambient light sensors and device cover plates: Per architect.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install devices at heights scheduled, and as indicated on drawings.

B. Install wall devices vertically on latch side of door within 6” of frame edge, unless otherwise noted.

C. Install ceiling devices as shown on drawings and as recommended by device manufacturer.

D. Ceiling mounted occupancy sensors shall be located minimum of 6 ft from supply air diffusers.

E. Install devices plumb, level with finished surfaces and free from blemishes.

F. Verify device locations prior to rough in.

G. Control wiring shall be low voltage, Class II wiring, electrically isolated from power wiring by a Class II transformer.

H. Provide separate neutral conductor for each dimmer.

I. Provide remote power pack and isolated relay outputs where wall switch style mounting is specified.

J. Wiring shall be in conduit.

K. Electrical Contractor shall be responsible for final adjustment and testing of all devices.

L. All lighting control devices shall be installed and programmed by a certified California Advanced Lighting Control Training Program Installer.

M. All line voltage controls shall be wired ahead of any room occupant controls so that lighting controls remain energized at all times.

3.02 TESTING

A. Verify proper location and operation of all devices.

B. Verify dimmers function without:
   1. Producing lamp flicker or audible noise.
   2. Interference of audio and visual equipment.

C. Adjust occupancy sensors for a 15, UNO minute time delay.

D. Adjust occupancy sensor sensitivity such that movement outside range of coverage shall not trigger sensor.

E. Adjust ambient light sensor to maintain illuminance level equal to light level from controlled lighting in the space when no daylight is present or as indicated per drawings. Demonstrate ambient light sensor(s) control lighting as specified.

F. The functionality of all installed lighting controls shall be verified by a certified California Advanced Lighting Control Training Program-Acceptance Test Technician as required in California Building Energy Efficiency Standards.

END OF SECTION

SECTION 262200 - LOW VOLTAGE TRANSFORMERS

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables

B. Section 26 05 26 – Grounding and Bonding for Electrical Systems

C. Section 26 05 33 – Raceway and Boxes for Electrical Systems

1.02 REFRENCE

A. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

1.03 DESCRIPTION

A. Section includes dry type distribution and buck-boost transformers rated 600V and less, with capacities up to 500KVA.

1.04 REFRENCE STANDARDS

A. ANSI/NECA 1 – Standard Practices for Good Workmanship in Electrical Contracting

B. IEE C57.12.91 – Test Code for Dry Type Distribution and Power Transformers

C. NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum)

D. NEMA ST 1 – Specialty Transformers (except General Purpose Type)

E. NEMA ST 20 – Dry-Type Transformers for General Applications

F. NFPA 70 – National Electrical Code

G. UL 506 – Specialty Transformers

H. UL 1561 – Dry-Type General Purpose and Power Transformers

I. 10 CFR 431.196 (a) (2) – Energy Conservation Standards and Their Effective Dates.

1.05 SUBMITTALS

A. Product Data:

1. Include rated nameplate data, capacities, minimum clearances, installed devices and features, and performance for each type and size of transformer indicated

B. Shop Drawings:

1. For each transformer size and type:

a. Physical dimensions, including bolting templates, weight, and center of gravity

b. Loads, method of field assembly, components, and location and size of each field connection

c. Wiring Diagrams: Power, signal, and control wiring

d. kVA rating

e. Primary taps

f. Insulation class and temperature rise

g. Efficiency values measured at 0, 25, 50, 75, and 100% load

h. Impedance value – X/R and %Z

i. Sound level

j. “K” factor listing, where applicable

C. Submit 1/4” scale electrical room floor plans with transformer locations.

D. Manufacturer’s Installation Instructions:

1. Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

E. Test Reports: Indicate field test and inspection procedures and interpret test results and corrective action taken for compliance with specification requirements.

F. Output Settings Report: Record output voltages and tap settings.

G. Closeout Submittals:

1. Project Record Documents:

a. Record actual locations of transformers

2. Operation and Maintenance Data:

a. Include manufacturer’s recommended operating instructions, maintenance procedures and intervals, and preventive maintenance instructions.

b. Include manufacturer’s Seismic Qualification Certification, Installation Seismic Qualification Certification, manufacturer’s Ultra Quiet

Transformers Sound Level Certification, where applicable, and Output Settings Report.

1.06 QUALITY ASSURANCE

A. Obtain transformers from one source and by single manufacturer.

B. Regulatory Requirements:

1. Comply with NFPA 70 for components and installation.

2. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and indicated.

C. Certificates:

1. Furnish Owner Representative with manufacturer's Ultra Quiet Transformers Sound Level Certification, where applicable: Submit certification that ultra-quiet transformers have sound level not exceeding 35 dB. Submit for each ultra-quiet transformer. Include the following:

2. Basis for Certification: Indicate whether certification is based on actual test of assembled components or on calculations

1.07 DELIVERY, STORAGE AND HANDLING

A. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect from dirt, water, construction debris, and traffic.

B. Temporary Heating: Apply temporary heat according to manufacturer's written instructions within the enclosure of each ventilated-type unit, throughout periods during which equipment is not energized and when transformer is not in a space that is continuously under normal control of temperature and humidity

1.08 WARRANTY

C. Refer to Division 01 and Section 26 00 00 – General Electrical Requirements for general warranty requirements.

D. The manufacturer shall provide a standard 1-year written warranty against defects in materials and workmanship for products specified in this Section. The warranty period shall begin on date of substantial completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Square D

B. Hammond Power

C. Cutler-Hammer

D. Or equal

2.02 DISTRIBUTION TRANSFORMERS

A. Fabrication:

1. NEMA ST 20, UL 1561
2. Factory assembled and tested
3. Air-cooled, for 60 Hz service
4. Two winding dry type
5. Coils
    a. Continuous wound construction and impregnated with non-hydroscopic, thermosetting varnish.
    b. Conductors: Continuous windings without splices, except for taps, and encapsulated wire resin compound to seal out moisture and air.
    c. Materials: Copper
    d. Separate primary and secondary
    e. Internal Connections: Braised or pressure type
6. Cores: High-grade silicon steel, non-aging, with high magnetic permeability, low eddy current losses and low hysteresis. Magnetic flux densities below saturation point. Core laminations clamped with steel members, one leg per phase.
7. Rubber vibration absorbing mounts to isolate base of enclosure from core and coil assembly.

    Transformer neutral visibly grounded to enclosures with flexible grounding conductor.

B. Enclosure:

1. NEMA 250
2. Type 2, unless otherwise indicated to comply with environmental conditions at installed location. (Exterior low voltage transformers are to be encapsulated type or non-ventilated type)
3. Code-gauge steel panel over core and coil.

4. Ventilated (air-cooled): Louvered openings for convection cooling.

5. Cooling and terminal chamber access with both sides and rear obstructed.

6. Manufacturer's lifting eyes or brackets.

7. Finish: Manufacturer's standard gray enamel over prime coat after being degreased, cleaned, and phosphatized.

C. Ratings:

1. KVA Rating: As required

2. Primary Voltage: As required

3. Secondary Voltage: As required

4. Insulation Class and Winding Temperature Rise:

a. Transformers 15kVA and smaller: Class 185°C, with 115°C temperature rise above 40°C ambient temperature, capable of carrying 15% continuous overload without exceeding 150°C rise.

b. Transformers 25kVA – 112.5kVA: Class 220°C, with 115°C temperature rise above 40°C ambient temperature, capable of carrying 15% continuous overload without exceeding 150°C rise.

c. Transformers above 112.5kVA: Class 220°C, with 115°C temperature rise above 40°C ambient temperature, capable of carrying 30% continuous overload without exceeding 150°C.

5. Top of Enclosure Temperature: Maximum 35°C above 40°C ambient temperature at warmest point at full load.

6. K-Factor Rating: K-4

D. Primary Taps:

1. Transformers rated 15kVA and larger: Two 2.5% above and two 2.5% below normal full capacity, minimum of four taps

E. Energy Efficiency:

1. Transformers rated 15kVA and larger, except K-rated, quiet type and ultra-quiet type:
   a. 10 CFR 431.196 (a) (2) compliant

F. Sound Levels:

1. NEMA ST 20, maximum average sound levels as follows:

a. 45 dB for general-purpose transformer sizes less than 51kVA.

b. 50 dB for general-purpose transformer sizes 51-150kVA.

c. 55 dB for general-purpose transformer sizes 151-300kVA

2. Minimum of 3 dB less than NEMA ST 20. Maximum average sound levels when factory tested according to IEEE C57.12.91 as follows:

a. 42 dB for quiet type transformer sizes less than 51kVA

b. 47 dB for quiet type transformer sizes 51-150kVA.

c. 52 dB for quiet type transformer sizes 151-300kVA.

3. Maximum average sound levels, when factory tested according to IEEE C57.12.91, as follows:

a. 35 dB for ultra quiet transformers, for all sizes through 300kVA.

G. Electrostatic Shielding, where indicated: Each winding with an independent, single, full-width copper electrostatic shield arranged to minimize interwinding capacitance.

1. Coil leads and terminal strips arranged to minimize capacitive coupling between input and output terminals.

2. Special terminal included for grounding the shield.

3. Shield Effectiveness:

a. Capacitance between Primary and Secondary Windings: Not to exceed 33 picofarads over a frequency range of 20 Hz to 1 MHz.

b. Common-Mode Noise Attenuation: Minimum of minus 120 dBA at 0.5 to 1.5 kHz; minimum of minus 65 dBA at 1.5 to 100 kHz.

c. Normal-Mode Noise Attenuation: Minimum of minus 52 dBA at 1.5 to 10 kHz.

2.03 LUGS

A. Manufacturer's primary and secondary bolted lugs: labeled for 75°C copper and aluminum conductors for ventilated enclosures

B. Connections at sides near bottom, accessible from front of cabinet.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine conditions for compliance with enclosure and ambient temperature requirements for each transformer.

B. Examine areas and surface to receive transformers for compliance with requirements, installation tolerances, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Verify space indicated for transformers' mounting meets code-required working clearances.

D. Notify Owner Representative of any discrepancies prior to submittal of product data and shop drawings.

E. Verify that ground connections are in place and requirements in Section 26 0526 – Grounding and Bonding for Electrical Systems have been met.

F. Verify with manufacturer that "touch-up" paint kit is available for repainting.

3.02 INSTALLATION

A. Install transformers in accordance with ANSI/NECA 1.

B. Install level and plumb within 1/2 degree, and at least 6" from the adjacent wall or structure to insure proper ventilation, in accordance with manufacturer's written instruction, and in compliance with recognized industry practices.

C. Transformer mounting, seismic restraints, and vibration control:

1. Install transformer anchorage devices based on design by an Engineer registered and licensed in the State of California.

2. Mount transformers on the floor.

3. Floor mounting:

a. Secure to floor via isolation pads between floor brackets (per manufacturer recommendations) and transformer.

b. Mount on spring isolator.

D. Install engraved plastic nameplates under provisions of Section 26 0553 – Electrical Systems Identification. No drilling, punching or screwing of nameplates is permitted. Use self-adhesive.

1. Indicate kVA rating, voltage/phase rating, taps, insulation class and temperature rise, impedance value, sound level, and K-factor listing

E. Install conduit per requirements in Section 26 0533 – Raceway and Boxes for Electrical Systems.

F. Install transformer in dedicated electrical space per NFPA 70 and as shown on drawings. Coordinate with miscellaneous trades for equipment foreign to the electrical installation to be outside of dedicated electrical space

3.03 CONNECTORS

A. Ground transformers according to Section 26 0526 – Grounding and Bonding for Electrical Systems.

B. Connect wiring according to Section 26 0519 – Low-Voltage Electrical Power Conductors and Cables. Mechanical lugs are not permitted for primary and secondary wiring. Install size specific corresponding compression terminations.

3.04 FIELD QUALITY CONTROL

A. Inspect transformers for physical damage, proper alignment, anchorage, grounding, connections, and installation.

B. Test transformers per requirements.

C. Interpret test results in writing and submit to Owner Representative.

D. Output Settings Report: Prepare a written report recording output voltages and tap settings, and submit to Owner Representative

3.05 REPAINTING

A. Remove paint splatters and other marks from surface of equipment.

B. Touch-up chips, scratches, or marred finishes to match the original finish, using the manufacturer-supplied paint kit. Leave the remaining paint with the Owner Representative.

3.06 ADJUSTING

A. Record transformer secondary voltage at each unit for at least 48 h of the typical occupancy period. Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding nameplate voltage plus 10% and not being lower than nameplate voltage minus 3% at maximum load conditions.

B. Connect buck-boost transformers to provide the nameplate voltage of equipment being served, plus or minus 5%, at secondary terminals.

3.07 CLEANING

A. Vacuum dirt and construction debris from the interior and exterior of equipment; do not use compressed air to assist in cleaning.

END OF SECTION

SECTION 262416 - DISTRIBUTION PANELBOARDS

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables

B. Section 26 05 26 – Grounding and Bonding for Electrical Systems

C. Section 26 43 00 – Surge Protective Devices

1.02 REFERENCE

A. Work under this Section is subject to the requirements of Contract Documents, including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

1.03 REFERENCE STANDARDS

A. NECA 407 - Recommended Practice for Installing and Maintaining Panelboards

B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum)

C. NEMA AB 1 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit Breaker Enclosures

D. NEMA FU 1 - Low-Voltage Cartridge Fuses

E. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum)

F. NEMA PB 1 - Panelboards

G. NEMA PB 1.1 - General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less

H. NFPA 70 - National Electrical Code

I. UL 50 - Enclosures for Electrical Equipment

J. UL 67 - Panelboards

K. UL 486A – 486B - Wire Connectors

L. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit Breaker Enclosures

M. UL 512 – Fuse-holders

N. UL 869A - Reference Standard for Service Equipment

1.04 SUBMITTALS

A. Product Data:

1. Submit catalog data showing specified features of standard products. Eliminate extraneous catalog data.

B. Shop Drawings:

1. Submit for review prior to manufacture. Include complete description, front view, dimensions, voltage, main bus ampacity, circuit breaker arrangement and sizes, short circuit current rating, and factory settings of individual protective devices.
2. Submit 1/4” scale electrical room floor plans with panelboard locations.

C. Partial Submittals:

1. Panelboards shall be submitted for review together. Partial submittals of panelboards are not acceptable and will be rejected.

D. Manufacturer’s Installation Instructions:

1. Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

E. Test Report:

1. Indicate field test and inspection procedures and interpret test results and corrective action taken for compliance with specification requirements.

F. Closeout Submittals:

1. Project Record Documents:
   a. Record actual locations of panelboards and record actual circuiting arrangements.
2. Operation and Maintenance Data:
   a. Include manufacturer’s recommended operating instructions, maintenance procedures and intervals, and preventive maintenance instructions.
   b. Include manufacturer’s written instructions for testing and adjusting overcurrent

protective devices.

c. Include time-current curves and selectable ranges for each type of overcurrent protective device.

d. Include spare parts data listing, source, and current prices of replacement parts and supplies.

e. Include manufacturer's Seismic Qualification Certification and Installation Seismic Qualification Certification.

1.05 QUALITY ASSURANCE

A. Obtain panelboards, overcurrent protective devices, components, and accessories from one source and by a single manufacturer.

B. Regulatory Requirements:

1. Comply with NFPA 70.
2. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and indicated.

1.06 DELIVERY, STORAGE AND HANDLING

A. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect from dirt, water, construction debris, and traffic.

B. Comply with NEMA PB 1.1 and manufacturer's written instructions.

1.07 WARRANTY

A. Refer to Division 01 and Section 26 00 00 – General Electrical Requirements for general warranty requirements.

B. Manufacturer shall provide standard 1-year written warranty against defects in materials and workmanship for products specified in this Section. Warranty period shall begin on date of substantial completion.

1.08 MAINTENANCE

A. Extra Materials: Extra Materials:

1. Furnish Owner Representative with two keys per panelboard.

PART 2 – PRODUCTS

2.01 MANUFACTURES

A. Square D

B. General Electric

C. Cutler Hammer

D. or equal

2.02 POWER DISTRIBUTION PANELBOARDS

A. NEMA PB 1, UL 67.

B. Distribution panelboards must be mounted in equipment enclosures that are 32” wide or larger.

C. Distribution panelboards rated 225A or greater shall have circuit breakers that can be installed and removed without manipulating hardware (nuts, bolts, fasteners, etc.) to connect the line side of the circuit breaker to the distribution panelboard buss.

D. Fabrication:
1. Factory assembled
2. Individualized breaker dead-front cover door-in-door construction
3. Incoming feeder lugs: copper conductors
4. Multiple lugs to match number of conductors per phase
5. Sub-feed (double) lugs, or feed-through lugs where indicated
6. Filler plates
7. Wiring terminals for field installed conductors: Pressure wire connectors, except wire- binding screws for #10 AWG or smaller conductors.

E. Panelboard Buses:
1. Copper
2. Ampere rating as scheduled
3. Ground bus: uninsulated, bonded to panelboard cabinet
4. Insulated neutral bus where applicable: 100% of phase bus rating

F. Molded-Case Circuit Breakers:
1. NEMA AB 1, UL 489
2. Bolt-on or I-line type, labeled for 75°C copper and aluminum conductors.
3. Quick-make, quick-break, with thermal-magnetic trip and electronic (solid-state microprocessor-based) trip.
4. Equipped with individually insulated, braced, and protected connectors
5. Common internal trip on multi-pole breakers. Handle-ties are not permitted.
6. Ampere rating as scheduled.
7. Front face flush with each other.

8. Large, permanent, individual circuit numbers affixed to each breaker in uniform position.
9. Tripped indication clearly shown by breaker handle taking position between “ON” and “OFF.”
10. Listed as Type HACR for air conditioning equipment circuits.
11. Bussing, device mounting hardware, and steel knockouts in dead front where “space” is indicated.
12. For 100A frame size and below: thermal-magnetic trip.
13. For 100A frame size and above: electronic trip units interchangeable in the field within the frame size and field-adjustable long time pick-up, long time delay, short time pick-up, short time delay, and instantaneous current settings. Each adjustment shall have discrete settings and shall be independent of all other adjustments.
14. Locks on trip handles where indicated.
15. Breakers 400A frame size and larger to be microprocessor controlled with LSI or LSIG trip functions.

G. Cabinet
1. NEMA 250, UL 50
2. NEMA Type 1, Type 3R (outdoor locations) enclosure.
3. Four-piece front (trim) surface mounted with door over the front, with concealed self- adjusting trim clamps, and complete with cylinder-type lock and catch except omit door in fusible switch panelboard.
4. Same height matching trim, where two cabinets are mounted adjacent to one another in finished areas.
5. All sections of panelboards have the same size, where oversize cabinets are required for one section of multi-section panelboard.
6. Boxes and fronts made of code-gauge galvanized steel.

2.03 SHORT CIRCUIT CURRENT RATING

A. Each panelboard has with minimum short circuit current rating as indicated on the drawings.

B. Panelboards marked with their maximum short-circuit current rating at supply voltage.

C. Panelboards: Fully rated. Series-rated panelboards are not acceptable.

2.04 SURGE PROTECTIVE DEVICES (SPD)

A. Furnished under 26 43 00 – Surge Protective Devices

B. Per requirements in Section 26 43 00 – Surge Protective Devices.

PART 3 – EXECUTION

3.01 COORDINATION WITH MANUFACTURER

C. Instruct the manufacturer about the location of additional wiring gutter space when required, i.e., top, bottom, right, left, or combination.

D. Instruct the manufacturer about the location of main lugs or main circuit breaker (i.e., top or bottom feed based on incoming feeder entrance location).

E. Instruct the manufacturer to provide multiple lugs where conductors in parallel or sub-feed (double) lugs or feed-through lugs are indicated.

F. Instruct the manufacturer on the size of cross-connection cables for panelboards fed via sub-feed (double) lugs or feed-through lugs. Make the cable size with ampacity equal to the incoming feeder.

G. Verify that the “touch-up” paint kit is available for repainting.

3.02 EXAMINATION

A. Verify that space indicated for panelboard mounting meets code-required working clearances and dedicated equipment space.

B. Notify Owner Representative of any discrepancies prior to submittal of product data and shop drawings.

3.03 INSTALLATION

A. Install panelboards in accordance with NECA 407 and NEMA PB 1.1.

B. Install panelboards plumb and rigid without distortion of box, in accordance with manufacturer's written instructions, and in compliance with recognized industry practices.

C. Panelboard mounting and seismic restraints:
1. Install panelboard anchorage devices based on design by an Engineer registered and licensed in the State of California.
2. Fasten panelboards firmly to walls and structural surfaces, ensuring they are permanently and mechanically anchored.
3. Install two rows of steel slotted channels, with a minimum of four attachment points, for each panelboard section.
4. When not located directly on wall, provide support frame of steel slotted channel anchored to floor and ceiling structure.

D. Install top breaker handle a maximum of 6’-7” above finished floor or working platform, with handle in its highest position.

E. Tighten electrical connectors and terminals according to equipment manufacturer's published torque tightening values. Where manufacturer’s torque values are not indicated, use those specified in UL 486A –486B.

F. Install as-built typewritten circuit directory in directory frame (to indicate installed circuit loads before completing load balancing) mounted inside each panelboard door. Include description of connected loads, room number, room name, area, or item served for each branch circuit. Indicate motor names and horsepower as applicable. Cover circuit directory with colorless plastic. Coordinate with Owner Representative and Architect to ensure that room numbers used in panel directory are final numbers assigned by Owner Representative.

G. Install engraved plastic nameplates under provisions of Section 26 05 53 – Electrical Systems Identification. Attach nameplate to the exterior of each panelboard using small, corrosion-resistant metal screws or rivets. Do not use contact adhesive.
   1. Indicate panelboard name, amperage, voltage, phase, and number of wires.

H. Label spare circuits as SPARE. Leave spare breakers in OFF position.

I. Room numbers used shall be those used by Owner Representative except as otherwise directed by Owner Representative.

J. Install panelboard in dedicated electrical space per NFPA 70 and as shown on drawings. Coordinate with miscellaneous trades for equipment foreign to the electrical installation to be outside of dedicated electrical space.

K. Install filler plates in unused spaces.

L. Request inspection from the District IOR 10 days prior to planned panel energization. Have all required testing complete and available for IOR inspection.

3.04 CONNECTIONS

A. Ground panelboards according to Section 26 05 26 – Grounding and Bonding for Electrical Systems.

B. Connect wiring according to Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.

3.05 FIELD QUALITY CONTROL

A. Inspect for physical damage, proper alignment, anchorage, and grounding.

B. Interpret test results in writing and submit to Owner Representative.

C. Check phase-to-phase and phase-to-ground insulation resistance levels prior to energizing panelboards.

D. Check panelboards for electrical continuity of circuits and for short-circuits prior to energizing.

E. Submit ammeter readings for all panelboard feeders indicating normal operating load and phase balance.

F. Balancing Loads: After Substantial Completion, but not more than 2 months after Final Acceptance, conduct load-balancing measurements and make circuit changes as follows:

1. Perform measurements during period of normal working load as advised by Owner Representative.
2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility. Make special arrangements with Owner Representative to avoid disrupting critical 24- hour services, such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
3. Recheck loads after circuit changes during normal load period. Record all load readings before and after changes and submit test records.
4. Tolerance: Difference exceeding 10% between phase loads, within a panelboard, is not acceptable.
5. Reconnect or redistribute circuits or circuit breakers to achieve balanced condition. Revise circuit directory to reflect circuiting changes required to balance phase loads.

3.06 REPAINTING

G. Remove paint splatters or other marks from surface of panelboards.

H. Touch-up chips, scratches, or marred finishes to match original finish, using the manufacturer-supplied paint kit. Leave the remaining paint to District's Representative.

3.07 CLEANING

A. Clean panelboard interiors and exteriors prior to final inspection. Remove paint splatters and other spots, dirt, and debris.

END OF SECTION

SECTION 264300 - SURGE PROTECTIVE DEVICES

PART 1 - GENERAL

1.01 RELATED WORK

A. Section 26 00 00 - General Electrical Requirements

B. Section 26 05 26 - Grounding and Bonding for Electrical Systems

C. Section 26 24 16 - Distribution Panelboards

1.02 REFERENCE

A. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

1.03 DESCRIPTION

A. Provide Type 1 Surge Protective Devices (SPD) for the protection of AC electrical circuits formerly known as Transient Voltage Surge Suppression (TVSS) System. Provide high-energy surge current diversion and be suitable for application in Type 1 environments.

B. Modes of Protection:

a. Line to Ground, Line to Neutral and Neutral to Ground for services with a neutral.
b. For Services without a neutral, Line to Line and Line to Ground.

C. Provide common and normal modes of protection.

1.04 REFERENCE STANDARDS

A. ANSI/UL 1449 Surge Protective Devices Third Edition or Newer

B. IEEE 587

C. FIPS PUB 94

D. IEEE C62.11 – Standard for Metal-Oxide Surge Arresters for Alternating Current Power Circuits (> 1 kV)

E. IEEE C62.41.1 Guide on the Surges Environment in Low-Voltage (1000 V and Less) AC Power Circuits

F. IEEE C62.41.2 Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and Less) AC Power Circuits

G. IEEE C62.45 IEEE Recommended Practice on Surge Testing for Equipment Connected to Low- Voltage (1000 V and less) AC Power Circuits

H. IEEE C62.62 IEEE Standard Test Specifications for Surge Protective Devices (SPDs) for Use on the Load Side of the Service Equipment in Low Voltage (1000V and less) AC Power Circuits

I. National Electrical Code – Article 285

J. NEMA LA 1 – Surge Arresters

K. National Fire Protection Association – NFPA 20, 70, 75, and 780

L. UL 96A Installation Requirements for Lightning Protection Systems

1.05 SUBMITTALS

A. Submit Shop Drawings for equipment provided under this Section.

B. Submit shop drawings and product information for approval and final documentation in quantities listed according to Conditions of the Contract. Identify customer name, customer location, and customer order number.

C. Submit ANSI/UL 1449 Listing documentation to indicate the following:

1. Short Circuit Current Rating (SCCR)
2. Voltage Protection Ratings (VPRs) for all modes
3. Maximum Continuous Operating Voltage rating (MCOV)
4. Nominal Discharge Current rating (I-n)
5. Type 1 device
6. VPR, MCOV, I-n, and Type 1 information is posted at www.UL.com under Certifications; search using UL Category Code: VZCA. SCCRs are posted in manufacturer's published documentation.
7. UL data and visual inspection takes precedence over manufacturer's published documentation.

D. Provide shop drawings including manufacturer installation instruction manual and line drawings detailing dimensions and weight of enclosure, internal wiring diagram illustrating all modes of protection in each type of SPD required, wiring diagram showing field connections, and manufacturer's recommended wire and breaker sizes (if required).

E. Upon request, modules using encapsulation shall be presented without encapsulation for visual inspection, proprietary technology included. MOV type and quantity shall reflect kA ratings on cutsheets, verification of diagnostic monitoring, thermal and overcurrent protection, etc.

PART 2 - PRODUCTS

2.01 MATERIAL

A. Acceptable manufacturers:

1. Advanced Protection Technologies, Inc. (APT)
2. Thomas & Betts; Current Technology
3. LEA International
4. Emerson; Liebert Corporation
5. Mersen
6. Erico
7. Or equal

2.02 PERFORMANCE CHARACTERISTICS

A. SPD shall bear the UL Mark and shall be Listed to the Third Edition of ANSI/UL 1449. “Manufactured in accordance with” is not equivalent to UL Listing and does not meet the intent of the specification.

B. Post SPD and performance parameters at www.UL.com under Category Code: VZCA. Products or parameters without posting at UL.com are not approved.

C. Minimum surge current capacity for Service Entrance units based on 8 x 20 microsecond current waveform:

1. 200,000 A between each phase for line-to-line mode
2. 200,000 A each phase for line-to-ground mode
3. 200,000 A each phase for line-to-neutral mode
4. 200,000 A for neutral-to-ground mode

D. Minimum surge current capacity for panelboard units based on 8 x 20 microsecond current waveform:

1. 80,000 A between each phase for line-to-line mode
2. 80,000 A each phase for line-to-ground mode
3. 80,000 A each phase for line-to-neutral mode
4. 80,000 A for neutral-to-ground mode

E. Sequential Surge Current Survivability:

1. 1,000 sequential category surges without failure.

F. Current Rating:

1. Rated for continuous current and AIC rating of equipment protected.
2. Mark SPD Short-Circuit Current Rating on the SPD label.

2.03 OPERATING CONDITIONS

A. Temperature range: -40°F to 122°F

B. Relative humidity range: 0 to 95%, non-condensing

C. Audible noise level: > 40 dBA at 5 ft

D. SPD Surface Temperature: less than131°F

2.04 FABRICATION

A. SPD Modules:

1. UL Labeled as Type 1 (verifiable at www.UL.com), intended for use without need for external or supplemental overcurrent controls. Protect suppression component of every mode, including N-G, by internal overcurrent and thermal overtemperature controls. SPDs relying on external or supplementary installed safety disconnects do not meet intent of specification.
2. UL Labeled with 20kA I-nominal (I-n) (verifiable at UL.com) for compliance to UL 96A Lightning Protection Mater label and NFPA 780.
3. Suppression components: Heavy-duty MOVs, selenium cells, or combination of both.
4. Provide surge current diversion paths for all modes of protection: L-N, L-G, N-G in WYE systems, and L-L, L-G in DELTA systems.
5. Provide service entrance SPD audible diagnostic monitoring by way of audible alarm.

6. Provide service entrance SPD with 1 set of NO/NC dry contacts for alarm conditions.
7. Provide visual LED diagnostics including a minimum of 1 green LED indicator per phase, and 1 red service LED. Include an audible alarm with on/off silence function and diagnostic test function (excluding branch).
8. If a dedicated breaker for the SPD is not provided in the switchgear, switchboard, or panelboard include an integral UL Recognized disconnect switch. Dedicated breaker to serve as a means of disconnect for distribution SPDs.
9. Meet or exceed the following criteria:
   a. ANSI/UL 1449 Listed Voltage Protection Ratings (VPRs) for 6kV 3000A testing as follows:

VOLTAGE	L-N L-G N-G	L-L
208Y/120V	≤800V	≤1200V
480Y/277V	≤1200V	≤2000V

10. ANSI/UL 1449 Listed Maximum Continuous Operating Voltage (MCOV) (verifiable at UL.com):

System Voltage	Allowable System Voltage Fluctuation (%)	MCOV
208Y/120	15%	150V
480Y/277	15%	350V

11. Provide serviceable, replaceable modules (excluding Branch).
12. Provide warranty for a period of 10 years, incorporating unlimited replacements of suppressor parts if they are destroyed by transients during the warranty period.
13. Provide SPD with digital surge event counter with capacitor backup.

B. Service Entrance:

1. Install 1 primary suppressor external to the service entrance in accordance with manufacturer instructions.
2. Install SPD on line or load side.
3. Bond SPD ground to service entrance ground.

C. Distribution Panelboards:

1. Install 1 suppressor external to each designated distribution panelboard.
2. Install surge suppression device in accordance with manufacturer instructions.

D. SPD Low-Impedance Interconnect Cable:

1. Provide low-impedance cable specifically listed for SPD installations.
2. Low impedance approximately 25% of conventional pipe and wire for improved clamping voltage.

PART 3 - EXECUTION

3.01 APPLICATION OF SPD

A. Provide UL approved disconnect switch at Service Entrance or Transfer Switch as a means of service disconnect if a breaker sized per manufacturer's recommendations is not available.

B. Provide independent means of servicing disconnect at Distribution, MCC, and Branch such that the protected panel remains energized. A 30A breaker (or larger based on manufacturer's recommendations) may serve this function.

C. Provide SPD for each panel, distribution panel associated with the Emergency branch of power.

3.02 INSTALLATION

A. Install per manufacturer's recommended practices.

B. Provide short and straight conductors not exceeding 3 ft in length. Manufacturer-approved cables may be used that allow conductor length to extend beyond 3 ft in length without affecting capability of unit.

C. Input conductors twisted together to reduce inductance.

D. Avoid 90-degree bends in cable.

3.03 QUALITY ASSURANCE

A. Factory test system before shipment. Include quality control check, "Hi-Pot" tests at 2 times rated voltage plus 1,000 V, ground leakage tests, and calibration.

B. Manufacturer Qualifications: Engage a firm with at least 5 yrs experience in manufacturing surge protective devices.

C. Manufacturer of equipment shall have produced similar electrical equipment for a minimum period of 5 yrs. When requested by Owner's Representative, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with requirement.

D. Provide SPD compliant with the Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC.

3.04 FIELD QUALITY CONTROL

A. Inspections before SPD startup:

1. Visual Inspection:
   a. Verify installation per drawings.
   b. Verify phase, neutral, and ground conductors are properly sized and configured.
2. Mechanical Inspection:
   a. Check connections for tightness.

b. Check terminal screws, nuts and/or connectors for tightness.

3. Electrical Inspection:
   a. Confirm input voltage.
   b. Confirm phase, neutral and ground connections are proper.

3.05 WARRANTY

A. Provide a 10-year manufacturer warranty.

END OF SECTION

SECTION 265600 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section specifies the furnishing, installation, and connection of exterior luminaires, controls, poles, and supports.

1.02 RELATED WORK

A. Section 26 05 33 - Raceways and Boxes for Electrical Systems
B. Section 26 05 19 - Low Voltage Electrical Power Conductors and Cables
C. Section 26 05 26 - Grounding and Bonding for Electrical Systems

1.03 SUBMITTALS

A. Submit in accordance with Division 26's requirements.

B. Shop Drawings:
   1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
   2. Include electrical ratings, dimensions, mounting, details, materials, required clearances, terminations, wiring and connection diagrams, photometric data, ballasts, poles, luminaires, effective projected area (EPA), lamps and controls.

1.04 APPLICABLE PUBLICATIONS

A. Publications listed below (including amendments, addenda, revisions, supplements) form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
B. American Society for Testing and Materials (ASTM).
C. American Concrete Institute (ACI).
D. American National Standards Institute (ANSI).
E. Aluminum Association Inc. (AA).
F. Illuminating Engineering Society of North America (IESNA).
G. National Electrical Manufacturers Association (NEMA).
H. National Fire Protection Association (NFPA).
I. Underwriters Laboratories, Inc. (UL).

1.05 DELIVERY, STORAGE, AND HANDLING

A. Poles: Do not store poles on ground. Store poles so they are at least one foot above ground level. Do not remove factory-applied pole wrappings until just prior to installation of pole.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment shall be in accordance with CEC, UL, ANSI, as shown on the drawings and as specified.

2.01 POLES

A. General:
   1. Poles shall be aluminum as specified in the fixture schedule and as shown on the drawings. Finishing shall be as approved by the Architect.
   2. The pole and arm assembly shall be designed for wind loading of 94 miles per hour, with an additional 1.3 gust factor, supporting luminaire(s) having the effective projected areas indicated as per manufacturer data.
   3. Poles shall be anchor-bolt type designed for use with underground supply conductors. Poles shall have a gasketed handhole with a minimum clear opening of 2” x 4”. Handhole cover shall be secured.

B. Provide a base cover matching the pole in material and color to conceal the mounting hardware, pole-base welds, and anchor bolts.

C. Types:
   1. Aluminum: Provide aluminum poles having a minimum 0.188 inches wall thickness with a minimum yield/strength of min. 35,000 psi and factory finish. Base covers for aluminum poles shall be structural quality cast from A356 aluminum alloy. Anchor bolts ASTM F1554 Grade 55 (55 KSI min. yield strength), galvanized per ASTM A-153.

2.03 FOUNDATIONS FOR POLES

A. Foundations shall be cast-in-place concrete.

B. Foundations shall support the effective projected area of the specified pole, arm(s), luminaire(s), and all accessories specified under wind conditions as specified in this section.

C. Place concrete in spirally wrapped treated paper forms for round foundations, and construct forms for square foundations.

D. Rub-finish and round all above-grade concrete edges to approximately 1/4” radius unless otherwise detailed.

E. Concrete shall have a 3000 psi minimum 28-day compressive strength.

F. Anchor bolt assemblies and reinforcing of concrete foundations shall be as shown on the drawings and meet ACI 318. Anchor bolts shall be in a welded cage or properly positioned by the tie wire to stirrups.

G. Install a copperclad ground rod, not less than 5/8" diameter by 8' long in pullbox adjacent to each fixture. Where rock or layered rock is present, drill a hole not less than 2" in diameter and 6' deep, backfill with tamped fine sand and drive the rod into the hole. Bond the rod to the pole with not less than number 6 AWG bare copper wires. The method of bonding shall be approved for the purpose.

H. After leveling of pole grout base solid between plate and footing with dry pack concrete for vibration reduction.

2.04 LUMINAIRES

A. UL 1598 and ANSI C136.17. Luminaires shall be weatherproof, heavy duty, outdoor types designed for efficient light utilization, adequate dissipation of lamp and ballast heat and safe cleaning and relamping.

B. Light emitting diode (LED)-based solid state lighting (SSL) products shall be factory tested in accordance to the International Engineering Society (IES) LM-79 recommendations and meet ANSI C78.377-2008 standards.

C. LED light sources shall be factory tested in accordance to IES LM-80 recommendations.

D. LED-based SSL product shall incorporate an external heat sink, integral to the luminaire.

E. IESNA HB-9 and RP-8 light distribution pattern types shall be as indicated on the drawings.

F. Incorporate associated ballasts and drivers within the luminaire housing.

G. Lenses shall be frame-mounted heat-resistant, borosilicate glass, prismatic refractors. Attach the frame to the luminaire housing by hinges or chain.

H. Pre-wire internal components to terminal strips at the factory.

I. Bracket mounted luminaries shall have leveling provisions and clamp type adjustable slip-fitters with locking screws.

J. Materials shall be rustproof. Latches and fittings shall be non-ferrous metal.

K. LED-based SSL luminaires shall be manufactured specifically for LED lamps with drivers integral to the luminaire housing.

2.05 LED-BASED SOLID-STATE DRIVERS

A. Shall be listed by either U.L. or equal listing agency and comply with IEEE C.62.41-1991, Class A operation.

B. Provide a minimum power factor of 0.9

C. Minimum operating temperature appropriate for outdoor environments.

D. Shall operate at a frequency greater than or equal to 120Hz.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install lighting in accordance with the CEC, as shown on the drawings, and in accordance with manufacturer's recommendations.

B. Poles:
1. Provide pole foundations with galvanized steel anchor bolts, threaded at the top end and bent 1.57 rad 90 degrees at the bottom end. Provide galvanized nuts, washers, and ornamental covers for anchor bolts. Thoroughly compact backfill with compacting arranged to prevent pressure between conductor, jacket, or sheath and the end of conduit elbow. Adjust poles as necessary to provide a permanent vertical position with the bracket arm in proper position for luminaire location.
2. After the poles have been installed, shimmed and plumbed, grout the spaces between the pole bases and the concrete base with non-shrink concrete grout material. Provide a plastic or copper tube, of not less than 3/8" inside diameter, through the grout tight to the top of the concrete base for moisture weeping.
3. Attach pole base cover to pole flange with set screws.

C. Foundation Excavation: Depth shall be as required. Dig holes large enough to permit the proper use of tampers to the full depth of the hole. Place backfill in the hole in 6" maximum layers and thoroughly tamp. Place surplus earth around the pole in a conical shape and pack tightly to drain water away.

3.02 GROUNDING

A. Ground noncurrent-carrying parts of equipment including metal poles, luminaries, mounting arms, brackets, and metallic enclosures as specified in Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS. Where copper grounding conductor is connected to a metal other than copper, provide specially treated or alloyed connectors suitable and listed for this purpose.

END OF SECTION

SECTION 312000 - EARTHWORK

PART 1 GENERAL

1.01 WORK SPECIFIED IN THIS SECTION

A. Work of this section includes all required excavation, grading, preparation of subgrade for fills, proper placement of fills, including backfilling and compaction, the watering, rolling and compacting of fill material in place and the finish grading all as required by the drawings and as specified herein.

B. All grading work shall be performed in accordance with:
1. Title 24, Part 2, C.C.R., 2022 C.B.C.
2. The grading code of the County and any special requirements of the permit.
3. The Geotechnical Investigation report for the project site
4. Provide special inspection for engineered fill and compaction, Title 24, Part 2, C.C.R., 2022 C.B.C.
5. Applicable General and Special Conditions of these specifications herein after set forth in full or by reference.
6. A final grading report shall be submitted by the Geotechnical Consultant in accordance with Title 24, Part 2, C.C.R., 2022 C.B.C. Appendix J

1.02 PRINCIPAL ITEMS OR WORK INCLUDED HEREIN.

A. Excavation

B. Filling

C. Backfilling

D. Geotechnical Consultant and Tests

E. Grading

F. Miscellaneous related work necessary for a complete job.

G. Special Requirements.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS.

A. Site Preparation & Plant Protection: 02 10 00

B. Demolition Section: 02 40 00

C. Landscape Soil Preparation: Section 02 91 10

D. Excavation and Fill: Section 31 23 00

E. Trenching and Backfilling: Section 31 23 33

PART 2 PROTECTION

2.01 Contractor shall protect adjacent properties, roads, right-of-ways, easements and existing improvements from damage during the life of the grading operation and prevent caving, sloughing or the placing of materials or stock piles on adjacent properties.

2.02 Provide cribbing, sheathing, and shoring necessary to safely retain the earth banks and protect excavations and adjoining grades from caving and other damage resulting from excavating, together with suitable forms of protection against bodily injury to personnel employed on the work and the general public. The responsibility for the design, installation, and maintenance of required cribbing and shoring shall be entirely that of the Contractor and shall meet the approval of the State Division of Industrial Safety and local governing agencies' requirements.

2.03 Utility lines and structures shown shall be protected and treated as indicated. Where work not shown is encountered, report it to the Owner’s Representative before proceeding with excavation. The Contractor shall bear the costs for all repairs to damaged or broken utilities and any damages related thereto.

2.04 It shall be the Contractor's full responsibility to take all measures necessary during grading to protect slope areas, both cut and fill, existing improvements and adjacent properties from storm damage and flood hazard originating on this project until final acceptance by the Owner. It shall be the Contractor's responsibility to maintain completed slopes until all slopes are in satisfactory compliance with the job specifications, all berms have been properly constructed, and all associates drainage devices have met the requirements of the Architect. It shall also be the Contractor's responsibility to prevent silt run-off from the limits of work.

PART 3 GEOTECHNICAL CONSULTANT, TESTS, AND REPORTS

3.01 A Geotechnical Consultant designated by the Owner will be engaged to perform continuous inspection of the placing and compacting of all fills and backfills within the limits of grading of this project. All work shall be done in accordance with these specifications and as recommended and approved by the Geotechnical Consultant. Costs for all such inspections and tests shall be paid by the Owner. The Contractor shall be responsible for notifying the Geotechnical Consultant in advance so that he may be present to perform his services as needed. The Geotechnical Consultant shall approve all subgrades prior to placement of fill or placement of forms and reinforcing.

3.02 The Geotechnical Consultant shall also make an investigation of the fill material to establish the ability of the soil to sustain the vertical loads to be imposed on the fill by the proposed structure.

3.03 The Geotechnical Consultant shall submit compaction reports to the Owner's Representative and the Civil Engineer at the completion of the work, including test results and plot plans indicating the locations from which the tested samples of fill were taken. The Geotechnical Consultant shall keep the Owner's Representative informed on the progress of the grading work.

3.04 No clearing, demolitions, filling and backfilling, or grading operations shall be performed without the presence of a representative of the Geotechnical Consulting firm. The presence of the Geotechnical Consultant will be for the purpose of providing observation and field testing, and will not include any supervising or directing of the actual work of the Contractor, directing his/her employees or agents. The geotechnical consultant to be on-stie during removal of footings, and underground utiliites. Neither the presence of the field representative nor the observations and testing by the Geotechnical Consulting firm shall excuse the Contractor in any way for defects discovered in the Contractor's work. The Geotechnical Consulting firm shall not be responsible for job or site safety on this project, which shall be the sole responsibility of the Contractor.

3.05 The existing soil conditions at this site have been investigated, and a report of findings is included in the bid documents. This information is offered as supplemental information only, and no guarantee of existing soil or other conditions is intended.

PART 4 MATERIALS

PART 5 SURPLUS EARTH MATERIAL

5.01 All surplus earth material will be used to balance the site. Excess material not needed for the completion of the grading shall be removed from the site by the Contractor and disposed of in a legal manner.

PART 6 INADEQUATE SOIL CONDITIONS

6.01 Should soil of inadequate density and bearing capability be encountered at the elevations indicated on the drawings, or where new fill is to be placed upon existing loose fill material exposed by excavation, the excavation shall be carried to the depth required to attain soil of bearing quality as determined by the Geotechnical Consultant. The adequacy of all soil bearing value shall be determined by the Geotechnical Consultant.

PART 7 EXECUTION

7.01 PREPARATION

A. Protect adjacent property and existing improvements and structures as necessary to prevent undermining, caving of cuts, and miscellaneous damage, or sloughing of material onto adjacent property.

B. Provide cribbing, sheathing, and shoring necessary to safely retain the earth banks and protect excavations and adjoining grades from caving and other damage resulting from excavation together with suitable forms of protection against bodily injury to personnel employed on the work and the general public. Be responsible for the design, installation, and maintenance of required cribbing and shoring and same shall meet the approval of the State Division of Industrial Safety and local governing agencies' requirements.

C. Protect existing improvements and adjacent properties from storm damage and flood hazard originating on this project until final acceptance by the Owner. Prevent silt runoff from the limits of work in accordance with governmental requirements, and the S.W.P.P.P.

D. Borrow pits, if any, shall meet all requirements of these Specifications for over-excavation and backfill.

7.03 DUST CONTROL

During all grading operations, water shall be applied to the surfaces in the working area at frequent intervals and in sufficient quantities to allay the dust and for proper compaction. No other method will be permitted.

7.04 CLEAN-UP

Upon completion of work in this Section, remove rubbish, trash, and debris resulting from operations. Remove disused equipment and implements of service, and leave entire area involved in a neat, clean, and acceptable condition.

7.05 EXCAVATION

A. Prior to any excavation or filling operation, the entire area within the limits of work containing vegetation shall be excavated to a minimum depth to ensure removal of all vegetation. This material shall be disposed of off the site in a legal manner.

B. Excavate to the depths, lines, and grades indicated. Excavate sufficiently over-size to permit installation and removal of concrete forms and all other required work.

C. Sequencing of the work to ensure that one part of the excavating does not interfere with another part rests with the Contractor.

D. At least 6 inches of topsoil should be removed from any areas that will receive

structural fill soils and/or structural improvements.

E. For slab on grade foundation, the upper 2 feet of subsurface soils within the proposed concession and restroom building footprint should be over-excavated and replaced by engineered fill.

7.06 FILLING

A. Prior to placing new fill in all other areas, the exposed cleared surface should be plowed, scarified, watered and/or aerated, as required, thoroughly mixed to a uniform, near optimum moisture condition, and recompacted to at least 95 percent of the ASTM D1557 test standard.

B. All recompacted and new fill required to secure final subgrade elevations should be spread, water and/or aerated as required, thoroughly mixed to a uniform near optimum moisture condition, and compacted not exceed 8-inch thick lifts to at least 95 percent. Backfilling of excavations made for removal of any existing buried elements during site clearing should also be performed in this manner.

C. Imported fill materials should consist of clean soils, free from vegetation, debris, or rocks larger than 3 inches. The Expansion Index value should not exceed a maximum of 50 ("Low" expansive per ASTM 4829 in geotechnical report.)

D. Where fills are placed on existing slopes exceeding a slope of five horizontal to one vertical, the slopes shall be benched in accordance with the Geotechnical Consultant's requirements and local governing public agencies' requirements, and compacted as herein specified before placing fill material on same, so that all fills shall be placed in horizontal layers as specified. Widths of benches shall be as directed by the Geotechnical Consultant.

E. Rock encountered in the excavation on this site may, at the option of the Contractor, be broken up into pieces not larger than three inches in maximum dimension, and be incorporated in the fill material if spread as directed by the Geotechnical Consultant. Otherwise, all rocks larger than three inches in maximum dimensions shall be removed from the site. Rocks and stones larger than one inch in maximum dimension will not be permitted within the top 12 inches of finished grade in non-paved areas.

F. Fill banks shall be graded full and compacted beyond the grade of the finish bank. After the banks have been filled, they shall be trimmed to the finish grades and limits shown on the drawings.

7.07 BACKFILLING

A. Place no backfill until work in excavations has been approved. Remove cave-ins and loose soil to permit inspection.

B. Place backfill in layers which will compact to six inches maximum, concurrently on both sides of footings and walls. Thoroughly compact each layer with mechanical

tampers, adding water as required to obtain optimum moisture content, and compact as set forth in paragraph 7.09 herein.

C. Backfill placed in narrow, restricted areas, such as along utility trenches, may possibly be placed in up to 12-inch thick lifts, depending on the materials, procedures and equipment being employed. Backfill consolidation by flooding or jetting is prohibited unless approved by the Geotechnical Consultant. In any case, all backfill should be mechanically compacted to at least 95 percent of the aforementioned test standard.

7.08 FINISH GRADING

A. Rocks or cobbles larger than 1-inch in diameter shall not be placed in the upper 12-inches of planting area fill, rocks. Cobbles larger than 3/4 inch shall not appear on the finish graded surface.

B. It shall be the Contractor's full responsibility to take all measures necessary during grading to protect slope areas, both cut and fill, and adjacent properties form storm damage and flood hazard originating on this project until final acceptance by the Owner. It shall be the Contractor's responsibility to maintain completed slopes until all slopes are in satisfactory compliance with the job specifications.

7.09 COMPACTION

A. All fills shall be compacted to at least 95 percent of maximum density obtainable using the ASTM test procedure D1557. All areas, which are scarified, shall be recompacted to these same requirements. Compaction at planting areas shall be per Specification Section 02 91 10.

B. All earthwork operations should be subject to compaction monitoring field observation and testing by the Geotechnical Consultant. The Geotechnical Consultant should be notified at least two days in advance of the start of grading. A joint meeting between a representative of the Client, the Contractor and the Geotechnical Consultant is recommended prior to grading to discuss specific procedures and scheduling.

C. Compaction by flooding or jetting is prohibited unless approved by the Geotechnical Consultant.

END OF SECTION

SECTION 312300 - EXCAVATION AND FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavation and/or embankment from existing ground to subgrade, including soil sterilant (refer to Section 31 31 19 – Vegetation Control), for roadways, driveways, parking areas, walks, paths, or trails and any other site improvements called for on the Plans.

1.02 SECTION EXCLUDES

A. Earthwork related to underground utility installation, see Section 31 23 33 – Trenching and Backfilling.

1.03 RELATED DOCUMENTS

A. ASTM:

1. D 1557, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

2. D 1586, Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils.

3. D 2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

4. D 3740, Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

5. D 4318. Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

6. E 329, Standard Specification for Agencies Engaged in Construction Inspection, Testing or special Inspection.

B. California Code of Regulation Title 24, Part 2, California Building Code:

1. Chapter 11B – Accessibility to Public Buildings.

2. Chapter 33 – Safeguards During Construction.

C. Caltrans Standard Specifications:

1. Section 10-6, Watering.

2. Section 19, Earthwork.

D. CAL/OSHA, Title 8.

1.04 DEFINITIONS

A. Borrow: Approved soil material imported from off-site for use as Structural Fill or Backfill.

B. Excavation: Removal of material encountered above subgrade elevations.

1. Authorized Over-Excavation: Excavation below subgrade elevations or beyond indicated horizontal dimensions as shown on plans.

2. Unauthorized Over-Excavation: Excavation below subgrade elevations or beyond indicated horizontal dimensions. Unauthorized excavation shall be without additional compensation.

C. Structural Backfill: Soil materials used to fill excavations resulting from removal of existing below grade facilities, including trees. See Section 31 23 33 – Trenching and Backfilling.

D. Structural Fill: Soil materials used to raise existing grades.

E. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material ¾-cubic yards or more in volume that, according to ASTM D 1586, exceeds a standard penetration resistance of 100 blows/2-inches.

F. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, base or topsoil materials.

G. Unsuitable Material: Any soil material that is not suitable for a specific use on the Project.

H. Utilities: onsite underground pipes, conduits, ducts and cables.

1.05 SUBMITTALS

A. Follow submittal procedures outlined in Division 01 Specifications.

B. Submit material certificates signed by the material producer and the Contractor, certifying that that each material item complies with, or exceeds the specified requirements.

1.06 QUALITY ASSURANCE

A. Conform all work to the appropriate portion(s) of the California Code of Regulations, Title 24 and Caltrans Standard Specifications, Sections 10-6 and 19.

B. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D 1557.

C. The project geotechnical engineer shall be notified of the construction schedule at least one week prior to the beginning of major site construction, and notified at least

48 hours (working days) before being required to perform field observation and testing.

1.07 PROJECT CONDITIONS

A. Promptly notify the Owner of surface or subsurface conditions differing from those disclosed in the construction documents. First notify the Owner verbally to permit verification and extent of condition and then in writing. No claim for conditions differing from those anticipated in the Contract Documents will be allowed unless the Contractor has notified the Owner in writing of differing conditions prior to the Contractor starting work on affected items.

B. Protect open excavations, trenches, and the like with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.

C. Prevent erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.

D. Temporarily stockpile fill material in an orderly and safe manner and in a location approved by the Owner.

E. Provide dust and noise control in conformance with Division 1 General Requirements for Cleaning and Waste Management.

F. Environmental Requirements: When unfavorable weather conditions necessitate interrupting earthwork operation, areas shall be prepared by compaction of surface and grading to avoid collection of water. Provide adequate temporary drainage to prevent erosion. After interruption, compaction specified in last layer shall be re-established before resuming work.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

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

B. On-Site Structural Fill and Structural Backfill: Soil or soil-rock mixture from on site excavations, free from organic matter or other deleterious substances. On-site structural fill and backfill shall not contain rocks or rock fragments over 4 inches in greatest dimension and not more than 15 percent shall be over 2-1/2 inches in greatest dimension and with an organic content less than 3.0 percent by weight.

PART 3 EXECUTION

3.01 GENERAL

A. Conform to Section 19, Earthwork, Caltrans Standard Specifications as modified by the Contract Documents.

B. Placement and compaction of material by flooding, ponding, or jetting will not be permitted.

C. The use of explosives will not be permitted.

3.02 CONTROL OF WATER AND DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding the site and surrounding area. Provide dewatering equipment necessary to drain and keep excavations and site free from water.

B. Dewater during backfilling operation so that groundwater is maintained a least one foot below level of compaction effort.

C. Obtain the Owner’s approval for proposed control of water and dewatering methods.

D. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations.

E. Maintain dewatering system in place until dewatering is no longer required.

3.03 WET WEATHER CONDITIONS

A. Do not prepare subgrade, place or compact soil materials if above optimum moisture content.

3.04 BRACING AND SHORING

A. Conform to California and Federal OSHA requirements.

B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the facility being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.

C. Be solely responsible for all bracing and shoring and, if requested by the Owner, submit details and calculations to the Owner. The Owner may forward the submittal to the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations related to the proposed facility shall precede a response to the submittal by the Owner.

D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the position or operation of the facility being constructed or adjacent utilities and facilities.

3.05 EXCAVATION

A. Excavate earth and rock to lines and grades shown on drawings and to the neat dimensions indicated on the Plans, required herein or as required to satisfactorily compact backfill.

B. Remove and dispose of large rocks, pieces of concrete and other obstructions encountered during excavation.

C. Provide supports, shoring and sheet piles required to support the sides of excavations or for protection of adjacent existing improvements.

3.06 GRADING

A. Uniformly grade the Project to slope to existing drains.

B. Finish ditches, gutters and swales to the sections, lines and grades indicated and to permit proper surface drainage to existing drain.

C. Round tops and bottoms of slopes as indicated or to blend with existing contours.

3.07 SUBGRADE PREPARATION

A. Protect utilities from damage during compaction of subgrades and until placement of final pavements or other surface facilities.

3.08 PLACEMENT OF STRUCTURAL FILL

A. Spread structural fill material in uniform lifts not more than 8-inches in un-compacted thickness and compact.

B. Place structural fill material to suitable elevations above grade to provide for anticipated settlement and shrinkage.

C. Backfill in uniform lifts not exceeding 8 inches in uncompacted thickness. Each lift should be brought to a uniform moisture content of at least 1 percent above optimum prior to compacting by either spraying the soil with water of it is too dry or aerating the material if it is too wet.

3.09 LOT FINISH GRADING

3.10 COMPACTION AND TESTING

A. Do not compact by ponding, flooding or jetting.

B. Compact soils at optimum water content. Aerate material if it is too wet. Add water to material if it is too dry. Thoroughly mix lifts before compaction to ensure uniform moisture distribution.

C. Perform compaction using rollers, pneumatic or vibratory compactors.

D. Compaction requirements:

1. Compact structural fills less than 5-feet thick to 90 percent compaction.

2. Compact structural fill 5-feet thick or greater to 95 percent compaction.

3. Compact the upper 6 inches of subgrade soils beneath pavements, curbs and gutters to 95 percent compaction. Extend compaction 5-feet beyond pavement.

4. Compact the upper 6-inches of subgrade soils to the following percentage of compaction: 95 percent under walks and pavements; 93 percent for foundations; and 90 percent for areas to receive structural fill."

3.11 DISPOSAL

A. Lawfully dispose of all unsuitable and excess or surplus material off-site at no cost to the Owner.

END OF SECTION

SECTION 312333 – TRENCHING AND BACKFILLING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavation, bedding, and backfill for underground storm drain, sanitary sewer, irrigation piping, water piping and associated structures.

1.02 SECTION EXCLUDES

A. Drainage fill material and placement around subdrains.

B. Trenching and backfill for other utilities such as underground HVAC piping, electrical conduit, telephone conduit, etc.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS.

A. Irrigation: 02 81 00

B. Excavation and Fill: Section 31 23 00

C. Utilities Structures: 33 05 16

D. Water Utilities: 33 10 00

E. Storm Drainage Utilities: 33 40 00

1.04 RELATED DOCUMENTS

A. ASTM:

1. C 33, Standard Specification for Concrete Aggregates.

2. C 150, Standard Specification for Portland Cement.

3. C 260, Standard Specification for Air-Entraining Admixtures for Concrete.

4. C 618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

5. D 1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

6. D 2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

7. D 2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

8. D 3740, Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

9. E 329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

10. E 548, Guide for General Criteria Used for Evaluating Laboratory Competence.

B. Caltrans Standard Specifications:

1. Section 19, Earthwork.

2. Section 26, Aggregate Bases.

3. Section 68, Subsurface Drains.

4. Section 96, Geosynthetics.

C. CAL/OSHA, Title 8.

1.05 DEFINITIONS

A. AC: Asphalt Concrete.

B. ASTM: American Society for Testing and Materials.

C. Bedding: Material from bottom of trench to bottom of pipe.

D. CDF: Controlled Density Fill.

E. DIP: Ductile Iron Pipe.

F. Initial Backfill: Material from bottom of pipe to 12-inches above top of pipe.

G. PCC: Portland Cement Concrete.

H. RCP: Reinforced Concrete Pipe.

I. Springline of Pipe: Imaginary line on surface of pipe at a vertical distance of ½ the outside diameter measured from the top or bottom of the pipe.

J. Subsequent Backfill: Material from 12-inches above top of pipe to subgrade of surface material or subgrade of surface facility or to finish grade.

K. Trench Excavation: Removal of material encountered above subgrade elevations and within horizontal trench dimensions.

1. Authorized Trench Over-Excavation: Excavation below trench subgrade elevations or beyond indicated horizontal trench dimensions as shown on plans.

2. Unauthorized Trench Over-Excavation: Excavation below trench subgrade elevations or beyond indicated horizontal trench dimensions. Unauthorized excavation shall be without additional compensation.

L. Utility Structures:

1. Storm drainage manholes, catch basins, drop inlets, curb inlets, vaults, etc.

2. Water vaults, etc.

1.06 SUBMITTALS

A. Follow submittal procedures outlined in Division 01 Specifications.

B. Product Data:

1. Grading and quality characteristics showing compliance with requirements for the Work.

2. Certify that material meets requirements of the Project.

C. Samples:

1. If required, provide 40-pound samples of all imported trench bedding and backfill material sealed in airtight containers, tagged with source locations and suppliers of each proposed material.

2. Provide materials from same source throughout work. Change of source requires approval of the Owner.

1.07 QUALITY ASSURANCE

A. Conform all work to the appropriate portion(s) of the Caltrans Standard Specifications, Section 19.

B. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D 1557.

C. Conform work to the requirements of the California Building Code.

1. Section 1809A.14 – Pipe and Trenches.

1.08 PROJECT CONDITIONS

A. Promptly notify the Owner of surface or subsurface conditions differing from those disclosed in the construction documents. First notify the Owner verbally to permit verification and extent of condition and then in writing. No claim for conditions differing from those anticipated in the Contract Documents will be allowed unless Contractor has notified the Owner in writing of differing conditions prior to contractor starting work on affected items.

B. Protect open, trenches, and utility structure excavations with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.

C. Stockpile on-site and imported backfill material temporarily in an orderly and safe manner.

D. Provide dust and noise control in conformance with Division 01 Specifications.

PART 2 PRODUCTS

2.01 PIPE BEDDING AND INITIAL BACKFILL

A. ASTM D 2321, Class IA, IB or II.

1. Clean and free of clay, silt or organic matter.

B. Permeable Material: Conform to Section 68-2.02F(3) of Caltrans Standard Specifications, Class 2 permeable.

C. Class 2 Aggregate Base: Conform to Section 26 of Caltrans Standard Specifications, ¾-inch maximum. Material shall also be non-expansive and predominantly granular soil or soil-rock mixture "(percent of passing #200: 50 maximum, 5 minimum)" with plasticity index of 15 or less.

D. Sand: Conform to Section 19-3.02F(2) of Caltrans Standard Specifications.

2.02 WARNING TAPE

A. See Section 33 10 00 – Water Utilities.

2.03 SUBSEQUENT BACKFILL

A. Conform to on-site or imported structural backfill in Section 31 23 00 – Excavation and Fill.

2.04 CONTROLLED DENSITY FILL (CDF) (IN TRENCHES)

A. Provide non-structural CDF, from bottom of trench to finish subgrade of subbase or base material, that can be excavated by hand and produce unconfined compressive 28-day strengths from 50-psi to a maximum of 150-psi. Provide aggregate no larger than 3/8-inch top size. The 3/8-inch aggregate shall not comprise more than 30% of the total aggregate content.

B. Cement: Conform to the standards as set forth in ASTM C-150, Type II Cement.

C. Fly Ash: Conform to the standards as set forth in ASTM C-618, for Class F pozzolan. Do not inhibit the entrainment of air with the fly ash.

D. Air Entraining Agent: Conform to the standards as set forth in ASTM C-260.

E. Aggregates need not meet the standards as set forth in ASTM C-33. Any aggregate, producing performances characteristics described herein will be accepted for consideration. The amount of material passing a #200 sieve shall not exceed 12% and no plastic fines shall be present.

F. Provide CDF that is a mixture of cement, Class F pozzolan, aggregate, air entraining agent and water. CDF shall be batched by a ready mixed concrete plant and delivered to the job site by means of transit mixing trucks.

G. The Contractor shall determine the actual mix proportions of the controlled density fill to meet job site conditions, minimum and maximum strengths, and unit weight. Entrained air content shall be a minimum of 4.0%. The actual entrained air content shall be established for each job with the materials and aggregates to be used to meet the placing and unit weight requirements. Entrained air content may be as high as 20% for fluidity requirements.

2.05 CONCRETE STRUCTURE BEDDING AND BACKFILL

A. Precast Structures: Same materials to the same heights as specified for pipe bedding and backfill.

B. Poured-in-Place Structures:

1. Bedding: In general, bedding is not required, pour bases against undisturbed native earth in cut areas and against engineered fill compacted to 90% relative compaction in embankment areas.

2. Side Backfill: On-site or imported structural fill meeting the requirements given in Section 31 23 00 – Excavation and Fill.

2.06 FILTER FABRIC

A. Filter Fabric:

1. Filter Fabric: Section 96-1.02B of Caltrans Standard Specifications.

2. Mirafi 140N (Mirafi Inc., Charlotte, NC) (Tel. 800-438-1855) or approved equal to products listed under 31 23 33.

PART 3 EXECUTION

3.01 TRENCHING AND EXCAVATION

A. Existing PCC or AC Areas: Cut PCC or AC to full depth at a minimum distance of 12-inches beyond the edge of the trench.

B. Excavate by hand or machine. For gravity systems begin excavation at the outlet end and proceed upstream. Excavate sides of the trench parallel and equal distant from the centerline of the pipe. Hand trim excavation. Remove loose matter.

C. Excavation Depth for Bedding: Minimum of 4-inches below bottom, except that bedding is not required for nominal pipe diameters of 2-inches or less.

D. Excavation Width at Springline of Pipe:

1. Up to a nominal pipe diameter of 24-inches: Minimum of twice the outside pipe diameter.

2. Nominal pipe diameter of 30-inches through 36-inches: Minimum of the outside pipe diameter plus 2-feet.

3. Nominal pipe diameter of 42-inches through 60-inches: Minimum of the outside pipe diameter plus 3-feet.

E. Over-Excavations: Backfill trenches that have been excavated below bedding design subgrade, with approved bedding material.

F. Comply with the Owner's limitations on the amount of trench that is opened or partially opened at any one time. Do not leave trenches open overnight without the approval of the Owner.

G. Where forming is required, excavate only as much material as necessary to permit placing and removal of forms.

H. Grade bottom of trench to provide uniform thickness of bedding material and to provide uniform bearing and support for pipe along entire length. Remove stones to avoid point bearing.

3.02 CONTROL OF WATER AND DEWATERING

A. Be solely responsible for dewatering trenches and excavations and subsequent control of ground and surface water. Provide and maintain such pumps or other equipment as may be necessary to control ground water.

B. Dewater during backfilling operation so that groundwater is maintained a least one foot below level of compaction effort.

C. Reroute surface water runoff away from open trenches and excavations. Do not allow water to accumulate in trenches and excavations.

D. Maintain dewatering system in place until dewatering is no longer required.

3.03 BRACING AND SHORING

A. Conform to California and Federal OSHA requirements.

B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the pipes and appurtenances being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.

C. Be solely responsible for all bracing and shoring and, if requested by the Owner, submit details and calculations to the Owner. The Owner may forward the submittal to the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations in trench section or around structures shall precede a response to the submittal by the Owner.

D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the line, grade, or backfill compaction or operation of the utility being installed or adjacent utilities and facilities.

3.04 PIPE BEDDING

A. Accurately shape bedding material to the line and grade called for on the Plans. Carefully place and compact bedding material to the elevation of the bottom of the pipe in layers not exceeding 8-inches in loose thickness. Compact bedding material at optimum water content to 95% relative compaction unless specified otherwise on the plans. Compact by pneumatic tampers or other mechanical means. Jetting or ponding of bedding material will not be permitted.

3.05 WARNING TAPE

A. Install in accordance with Section 33 10 00 – Water Utilities.

3.06 BACKFILLING

A. Bring initial backfill up simultaneously on both sides of the pipe, so as to prevent any displacement of the pipe from its true alignment. Carefully place and compact initial backfill material to an elevation of 12-inches above the top of the pipe in layers not exceeding 8-inches in loose thickness. Compact bedding material at optimum water content to 95% relative compaction unless specified otherwise on the plans. Compact by pneumatic tampers or other mechanical means. Jetting or ponding of initial backfill material will not be permitted.

B. Bring subsequent backfill to subgrade or finish grade as indicated. Carefully place and compact subsequent backfill material to the proper elevation in layers not exceeding 8-inches in loose thickness. Compact bedding material at optimum water content to 95% relative compaction, unless specified otherwise on the Plans. Compact by pneumatic tampers or other mechanical means. Jetting or ponding of subsequent backfill material will not be permitted.

C. Do not use compaction equipment or methods that produce horizontal or vertical earth pressures that may cause excessive pipe displacement or damage the pipe.

3.07 CLEANUP

A. Upon completion of utility earthwork all lines, manholes catch basins, inlets, water meter boxes and other structures shall be thoroughly cleaned of dirt, rubbish, debris and obstructions of any kind to the satisfaction of the Owner.

END OF SECTION

SECTION 313119 - VEGETATION CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Application of soil sterilant on subgrades for roadways, driveways, parking areas, walks, paths, trails and any other site improvements called for on the plans.

1.02 RELATED SECTIONS

A. Section 31 23 00 – Excavation and Fill.

1.03 RELATED DOCUMENTS

A. CAL/OSHA, Title 8.

1.04 SUBMITTALS

A. Follow submittal procedures outlined in Division 01 Specifications.

B. Herbicide submittal specification: submit a written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by Construction Manager.

PART 2 PRODUCTS

2.01 SOIL STERILANT

A. Commercial chemical for weed control, registered by EPA. Provide granular, liquid or wet-able powder form.

PART 3 EXECUTION

3.01 SOIL STERILIZATION

A. Apply soil sterilant to areas indicated, such as beneath asphalt concrete pavement, brick pavement, concrete pavement and at grade concrete slabs, including sidewalks, curbs and gutters. Also where indicated apply soil sterilant below expansion and control joints and at areas where pipes, ducts or other features penetrate slabs.

B. Apply soil sterilant uniformly and at the rates recommended by the manufacturer.

C. Apply soil sterilant to prepared subgrade, or after installation of aggregate base as recommended by the manufacturer.

D. When using pesticides on school property the contractor shall post 72 hours prior and leave posting up for 72 hours after. Contractor shall not spray if it is windy. If the

herbicide product, is not currently on Merced School District's website or in their binders and files, the contractor shall get product approval from Merced School District's Risk Management team before applying the herbicide.

3.02 DISPOSAL

A. Lawfully dispose of all unsuitable and excess or surplus material off-site at no cost to the Owner.

END OF SECTION

SECTION 320523 - CONCRETE FOR EXTERIOR IMPROVEMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES: REFER TO GEOTECHNICAL REPORT

A. Materials for portland cement concrete.

B. Aggregate and aggregate grading for portland cement concrete.

C. Water for portland cement concrete.

D. Admixtures for portland cement concrete.

E. Proportioning for portland cement concrete.

F. Mixing and transporting portland cement concrete.

G. Formwork for cast in place portland cement concrete.

H. Embedded materials for portland cement concrete.

I. Steel reinforcement for portland cement concrete.

J. Placing and finishing portland cement concrete.

K. Curing portland cement concrete.

L. Protecting portland cement concrete.

1.02 RELATED DOCUMENTS

A. ASTM Standards
   1. A 1064, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
   2. A 615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
   3. C 94, Standard Specification for Ready-Mixed Concrete.
   4. C 114, Standard Test Methods for Chemical Analysis of Hydraulic Cement.
   5. C 150, Standard Specification for Portland Cement.
   6. C 618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
   7. D 1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruded and Resilient Bituminous Types).

B. Caltrans Standard Specifications:
   1. Section 51: Concrete Structures.

2. Section 73: Concrete Curbs and Sidewalks.
3. Section 90-1: General section of Concrete section.

C. California Building Code:
1. Chapter 11B – Accessibility To Public Buildings, Public Accommodations, Commercial Buildings and Public Housing.
2. Chapter 19A – Concrete.
3. Chapter 33 – Safeguards During Construction.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. 32 13 00 – Rigid Paving

1.04 DEFINITIONS

A. ASTM: American Society for Testing and Materials.

1.05 SUBMITTALS

A. Follow submittal procedures outlined in Division 01 Specifications.

B. Design Mixes: Have all concrete mixes designed by a testing laboratory and approved by the Consulting Engineer. Conform all mixes to the applicable building code requirement, regardless of other minimum requirements listed herein or on the drawings. Submit mix designs for review before use. Show proportions and specific gravities of cement, fine and coarse aggregate, and water and gradation of combined aggregates.

C. Reinforcing Steel Shop-Drawings

1.06 QUALITY ASSURANCE

A. Concrete shall be subject to quality assurance in accordance with Section 90 of the Standard Specifications.
1. Slump tests: Have available, at job site, equipment required to perform slump tests. Make one slump test for each cylinder sample, from same concrete batch. Allowable maximum slump shall be 4 inches for walls and 3 inches for slabs on grade and other work.

B. Certifications:
1. Provide Owner's Representative at the time of delivery with certificates of compliance signed by both Contractor and Supplier containing the following statements:
2. Materials contained comply with the requirements of the Contract Documents in all respects.
3. Proportions and mixing comply with the design mix approved by the Consulting Engineer. Design mix shall have been field tested in accordance with the herein

requirements of the Caltrans Standard Specifications and produces the required compressive strength under like conditions.
4. Statement of type and amount of any admixtures.
5. Provide Owner's Representative, at time of delivery, with certified delivery ticket stating volume of concrete delivered and time of mixing, or time of load-out in case of transit mixers.

C. Conform to the applicable provisions of Section 51, 73 and 90 of the Caltrans Standard Specification and these Technical Specifications.
1. Conform construction of portland cement concrete surface improvements (including curbs, gutters, medians, valley gutters, walks) to the requirements of Section 73 of the Caltrans Standard Specifications unless otherwise required in these Technical Specifications or shown on the Plans.
2. Construct "V" ditches in accordance with Section 72-5.03 of the Standard Specifications; except that finishing shall be in accordance with Standard Specification Section 73 instead of 53, or as otherwise required in these Technical Specifications or shown on the Plans.
3. Conform other construction of portland cement concrete items to the requirements of Section 51 of the Caltrans Standard Specifications unless otherwise required in these Technical Specifications or shown on the Plans.

D. Conform to the requirements of the California Building Code section 1929A.2 for testing of reinforcing bars.

1.07 DESIGNATION

A. General: Whenever the 28-day compressive strength is designated herein or on the plans is greater than 3,600 psi, the concrete shall considered to be designated by compressive strength. The 28-day compressive strength shown herein or on the plans which are 3,600 psi or less are shown for design information only and are not considered a requirement for acceptance of the concrete. Whenever the concrete is designated by class or as minor concrete herein or on the plans, the concrete shall contain the cement per cubic meter shown in section 90-1.01 of the Caltrans Standard Specifications.

B. Unless specified otherwise herein or on the Plans, Portland Cement Concrete for this Project shall be Class "2" as specified in Section 90-1.01 of the Caltrans Standard Specifications.

PART 2 PRODUCTS

2.01 PORTLAND CEMENT

A. General: Type V or type II (modified) cement conforming to the requirements of ASTM C 150, with the following modifications:
1. Cement shall not contain more than 0.60% by weight of alkalies, calculated as the percentage of Na_2O plus 0.658 times the percentage of K_2O when determined by either 4 intensity flame photometry or by the atomic absorption

method. The instrument and procedure used shall be qualified as to precision and accuracy in accordance with the requirements of ASTM C 114.

2. The autoclave expansion shall not exceed 0.50%.
3. Mortar containing the Portland Cement to be used and the sand, when tested in accordance with Test Method No. Calif. 527, shall not expand in water more than 0.010% and shall have an air content less than .048%.
4. Allowable tri-calcium Aluminate (C_3A) by weight shall not exceed 5%.
5. Allowable tetra calcium alumino ferrite plus twice the tricalcium aluminate (C_4AF+2C_3A) by weight shall not exceed 25%. The sulfate expansion test (ASTM C 452) may be used in lieu of the above chemical requirements, provided the sulfate expansion does not exceed 0.040% at 14 days (max.).
6. Contractor may substitute pozzolan for Portland Cement in amounts up to 15% of the required mix unless high early strength concrete is specified. Pozzolan shall consist of Class F Fly Ash meeting the requirements of ASTM C 618.

B. Cement for Surface Improvements: Provide a coloring equivalent to ¼ pound of lampblack per cubic yard. Add to the concrete at the central mixing plant.

C. Liquiblack, as supplied by Concrete Corporation of Redwood City, California, may be used in lieu of lampblack. One pint of liquiblack shall be considered equal to one pound of lampblack.

2.02 AGGREGATE AND AGGREGATE GRADING

A. General: Conform to the requirements of Section 90-1.02C(1), 1.02C(2) and 1.02C(3) of the Caltrans Standard Specifications.

B. Aggregate Size and Gradation: Conform to the requirements of section 90-3 of the Caltrans Standard Specifications for 25-mm (1-inch) maximum combined aggregate.

2.03 WATER

A. General: Conform to the requirements of section 90-1.02D of the Caltrans Standard Specifications, for mixing and curing portland cement concrete and for washing aggregates.

2.04 CLASSIFICATION OF PORTLAND CEMENT CONCRETE

A. Concrete for the following items shall be designated by the following classes per Section 90-1.01 of the Caltrans Standard Specifications:
   1. Vehicular Pavement: Class 2.
   2. Curbs, Gutters, and Sidewalks: Minor Concrete.
   3. Cast in place Concrete Pipe: The concrete shall consist of a minimum of 564 pounds of Portland cement per cubic yard of concrete.
   4. Thrust Blocks: The concrete shall have a minimum compressive strength of 3,000 psi.
   5. Sign and Fence Footings: The concrete shall consist of a minimum of 376 pounds of Portland cement per cubic yard of concrete.

6. Water, Storm, and Sanitary Structures: The concrete shall consist of a minimum of 564 pounds of Portland cement per cubic yard of concrete.

2.05 EXPANSION JOINT MATERIAL

A. Material for expansion joints in portland cement concrete improvements shall be premolded expansion joint fillers conforming to the requirements of ASTM Designation D 1751. Expansion joint material shall be shaped to fit the cross section of the concrete prior to being placed. Suppliers certificates showing conformance with this specification shall be delivered with each shipment of materials delivered to the job site. Unless noted otherwise herein or on the Plans expansion joint thickness shall be as follows:
   1. Sidewalks, Driveways and Gutter Depressions: width of expansion joints per landscape plan and details: ½-inch.
   2. Concrete Slope Protection, Gutter Lining, Ditch Lining and Channel Lining: ½-inch.
   3. Structures: As indicated.

2.06 REINFORCEMENT AND DOWELS

A. Bar reinforcement for concrete improvements shall be deformed steel bars of the size or sizes called for on the plans conforming to the requirements of ASTM Designation A 615 for Grade 60 bars. Size and shape for bar reinforcement shall conform to the details shown or called for on the Plans. Substitution of wire mesh reinforcement for reinforcing bars will not be allowed.

B. Slip dowels, where noted or called for on the plans or detail drawings shall be smooth billet-steel bars as designated and conforming to the requirements of ASTM Designation A 615 for Grade 60 bars. Ends of bars inserted in new work shall be covered with a cardboard tube sealed with cork; no grease or oil shall be used.

C. Mesh for reinforcement for concrete improvements shall be cold drawn steel wire mesh of the size and spacing called for on the plans conforming to the requirements of ASTM Designation A 1064 for the material and mesh. Size and extent of mesh reinforcement shall conform to the details shown or called for on the plans.

D. Tie wire for reinforcement shall be eighteen (18) gauge or heavier, black, annealed conforming to the requirements of ASTM Designation A 1064.

E. Suppliers certificates showing conformance with this specification shall be delivered with each shipment of materials delivered to the job site.

2.07 ACCESSORY MATERIALS

A. Conform water stops and other items required to be embedded in of Portland Cement Concrete structures to the applicable requirements of Section 51 of the Caltrans Standard Specifications unless otherwise specifically noted or called for on the Plans or detail drawings.

B. Curing Compounds:

1. Regular Portland Cement Concrete: "Non-Pigmented Curing Compound - chlorinated Rubber Base-Clear" conforming to the requirements contained in Section 90-1.03B(3), of the Caltrans Standard Specifications.
2. Color Conditioned Decorative Portland Cement Concrete: LITHOCHROME colorwax as manufactured by the L. M. Scofield Company or approved equal.

2.08 FORMS

A. Conform to the requirements of Section 51-1.03C(2) of the Caltrans Standard Specifications.

2.09 PRECAST CONCRETE STRUCTURES

A. Conform to the following Sections of Caltrans Standard Specifications:
   1. 51-7, Minor Structures.
   2. 70-5.02, Flared End Sections.
   3. 70-1.02H, Precast Concrete Structures.

2.10 PORTLAND CEMENT CONCRETE VEHICULAR PAVEMENT

A. General: See Section 32 13 00 – Rigid Paving.

PART 3 EXECUTION

3.01 STRUCTURAL EXCAVATION

A. Structural excavation may be either by hand, or by machine and shall be neat to the line and dimension shown or called for on the plans. Excavation shall be sufficient width to provide adequate space for working therein, and comply with CAL-OSHA requirements.

B. Where an excavation has been constructed below the design grade, refill the excavation to the bottom of the excavation grade with approved material and compact in place to 95% of the maximum dry density.

C. Remove surplus excavation material remaining upon completion of the work from the job site, or condition it to optimum moisture content and compact it as fill or backfill on the site.

3.02 SOIL STERILANT

A. Furnish and apply to areas indicated in accordance with Section 31 31 19 – Vegetation Control.

3.03 BRACING AND SHORING

A. Conform to California and Federal OSHA requirements.

B. Place and maintain such bracing and shoring as may be required to support the sides of the excavations for the proper protection of workmen; to facilitate the work; to prevent damage to the facility being constructed; and to prevent damage to adjacent structures or facilities. Remove all bracing and shoring upon completion of the work.

C. Be solely responsible for all bracing and shoring and, if requested by the Owner's Representative, submit details and calculations to the Owner's Representative. The Owner's Representative may forward the submittal to the Consulting Engineer and/or the California Division of Industrial Safety for their review. The Contractor's submittal shall include the basic design, assumed soils conditions and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used, and shall be prepared by a civil engineer or structural engineer registered in California. No excavations related to the proposed facility shall precede a response to the submittal by the Owner's Representative.

D. Be solely responsible for installing and extracting the sheathing in a manner which will not disturb the position or operation of the facility being constructed or adjacent utilities and facilities.

3.04 PLACING CONCRETE FORMS

A. Form concrete improvements with a smooth and true upper edge. Side of the form with a smooth finish shall be placed next to concrete. Construct forms rigid enough to withstand the pressure of the fresh concrete to be placed without any distortion.

B. Thoroughly clean all forms prior to placement and coat forms with an approved form oil in sufficient quantity to prevent adherence of concrete prior to placing concrete.

C. Carefully set forms to the alignment and grade established and conform to the required dimensions. Rigidly hold forms in place by stakes set at satisfactory intervals. Provide sufficient clamps, spreaders and braces to insure the rigidity of the forms.

D. Provide forms for back and face of curbs, lip of gutters and edge of walks, valley gutters or other surface slabs that are equal to the full depth of the concrete as shown, noted or called for on the Plans. On curves and curb returns provide composite forms made from benders or thin planks of sufficient ply to ensure rigidity of the form.

3.05 PLACING STEEL REINFORCEMENT

A. Bars shall be free of mortar, oil, dirt, excessive mill scale and scabby rust and other coatings of any character that would destroy or reduce the bond. All bending shall be done cold, to the shapes shown on the plans. The length of lapped splices shall be as follows:
   1. Reinforcing bars No. 8, or smaller, shall be lapped at least 45 bar diameters of the smaller bar joined, and reinforced bars Nos. 9, 10, and 11 shall be lapped at least 60 bar diameters of the smaller bars joined, except when otherwise shown on the plans.

2. Splice locations shall be made as indicated on the plans.

B. Accurately place reinforcement as shown on the plans and hold firmly and securely in position by wiring at intersections and splices, and by providing precast mortar blocks or ferrous metal chairs, spacers, metal hangers, supporting wires, and other approved devices of sufficient strength to resist crushing under applied loads. Provide supports and ties of such strength and density to permit walking on reinforcing without undue displacement.

C. Place reinforcing to provide the following minimum concrete cover:
1. Surfaces exposed to water: 4-inches.
2. Surfaces poured against earth: 3-inches.
3. Formed surfaces exposed to earth or weather: 2-inches.
4. Slabs, walls, not exposed to weather or earth: 1-inch.

D. Minimum spacing, center of parallel bars shall be two and one half (2-1/2) times the diameter of the larger sized bar. Accurately tie reinforcing securely in place prior to pouring concrete. Placing of dowels or other reinforcing in the wet concrete is not permitted.

3.06 MIXING AND TRANSPORTING PORTLAND CEMENT CONCRETE

A. Transit mix concrete in accordance with the requirements of ASTM Designation C 94. Transit mix for not less than ten (10) minutes total, not less than three (3) minutes of which shall be on the site just prior to pouring. Mix continuous with no interruptions from the time the truck is filled until the time it is emptied. Place concrete within one hour of the time water is first added unless authorized otherwise by the Owner's Representative.

B. Do not hand mix concrete for use in concrete structures.

3.07 PLACING PORTLAND CEMENT CONCRETE

A. Thoroughly wet subgrade when concrete is placed directly on soil. Remove all standing water prior to placing concrete.

B. Do not place concrete until the subgrade and the forms have been approved.

C. Convey concrete from mixer to final location as rapidly as possible by methods that prevent separation of the ingredients. Deposit concrete as nearly as possible in final position to avoid re-handling.

D. Place and solidify concrete in forms without segregation by means of mechanical vibration or by other means as approved by the Owner's Representative. Continue vibration until the material is sufficiently consolidated and absent of all voids without causing segregation of material. The use of vibrators for extensive shifting of fresh concrete will not be permitted.

E. Concrete in certain locations may be pumped into place upon prior approval by the Owner's Representative. When this procedure requires redesign of the mix, such redesign shall be submitted for approval in the same manner as herein specified for approval of design mixes.

3.08 PLACING ACCESSORY MATERIALS

A. Place water stops and other items required to be embedded in of portland cement concrete structures at locations shown or required in accordance with Section 51 of the Caltrans Standard Specifications unless otherwise specifically noted or called for on the Plans.

B. Curing Compounds:
   1. Regular Portland Cement Concrete: Apply "Non-Pigmented Curing Compound - chlorinated Rubber Base-Clear" in accordance with Section 90-1.03B(3), 1.03B(5) and 1.03B of the Caltrans Standard Specifications.

3.09 EXPANSION JOINTS

A. Construct expansion joints incorporating premolded joint fillers at twenty (20) foot intervals in all concrete curbs, gutters, sidewalks, median/island paving, valley gutters, driveway approaches and at the ends of all returns. At each expansion joint install one-half inch by twelve inch (1/2" x 12") smooth slip dowels in the positions shown or noted on the detail drawings. Refer to landscape plans for additional requirements.

B. Orient slip dowels at right angles to the expansion joint and hold firmly in place during the construction process by means of appropriate chairs.

3.10 WEAKENED PLANE JOINTS

A. Construct weakened plane or control joints in concrete curbs, gutters, sidewalks, median/island paving and valley gutters between expansion joints at ten (10) foot intervals throughout, or as otherwise indicated. Depth of joint score depth to be one-fourth (25%) the thickness of the concrete.
   1. Grooved Joints: Form weakened plane joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8-inch. Repeat grooving of weakened plane joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

3.11 FINISHING CONCRETE

A. Finish curb and gutter in conformance with the applicable requirements of Section 73-1.03C and 73-1.05A of the Caltrans Standard Specifications as modified herein.

B. Where monolithic curb, gutter and sidewalk is specified, separate concrete pours will not be allowed.

C. Provide a medium broom finish to all horizontal surfaces unless otherwise shown.

3.12 FORM REMOVAL

A. Remove forms without damage to the concrete. Remove all shores and braces below the ground surface, before backfilling.

B. Do not backfill against concrete until the concrete has developed sufficient strength to prevent damage.

C. Leave forms for cast-in-place walls in place at least 72 hours after pouring.

D. Leave edge forms in place at least 24 hours after pouring.

3.13 CONSTRUCTION

A. Form, place and finish concrete walkways, island paving, valley gutters and driveway approaches in conformance with the applicable requirements of Section 73-1.03C and 73-3 of the Caltrans Standard Specifications as modified herein.

B. Construct new concrete curb, curb and gutter and valley gutters against existing asphalt concrete by removing a minimum of 12-inches of the asphalt concrete to allow placement of curb or gutter forms. Patch pavement with a 6-inch deep lift of asphalt concrete after gutter form is removed.

3.14 CONNECTING TO EXISTING CONCRETE IMPROVMENTS

A. New curb, gutter, or sidewalk is to connect to existing improvements to remain by saw cutting to existing sound concrete at the nearest score line, expansion joint or control joint. Drill and insert ½-inch diameter by 12-inch long dowels at 24-inches on center into existing improvements. Install pre-molded expansion joint filler at the matching joint.

B. A cold joint to the existing curb is not acceptable.

3.15 FIELD QUALITY CONTROL

A. Finish subgrade for concrete improvements shall be subject to approval prior to placement of forms.

B. No concrete shall be placed prior to approval of forms.

C. Concrete improvements constructed shall not contain "bird baths" or pond water and shall be smooth and ridge free.

D. Conform the finish grade at top of curb, flow line of gutter, and the finish cross section of concrete improvements to the design grades and cross sections.

E. Variation of concrete improvements from design grade and cross section as shown or called for on the plans shall not exceed the tolerances established in Sections 73-1.03 and/or 73-3 of the Caltrans Standard Specifications.

3.16 RESTORATION OF EXISTING IMPROVEMENTS

A. Replace in kind all pavement or other improvements removed or damaged due to the installation of concrete improvements.

B. Remove, landscaping or plantings damaged or disturbed due to the installation of concrete improvements. Replace in kind.

END OF SECTION

SECTION 321100 - BASE COURSES

PART 1 GENERAL

1.01 SECTION INCLUDES: REFER TO GEOTECTNICAL REPORT

A. Aggregate subbase.

B. Aggregate base.

C. Cement treated base.

D. Lime stabilization.

1.02 RELATED DOCUMENTS

A. ASTM:
   1. D 3740, Standard Practice for Minimum Requirement for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
   2. E 329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
   3. E 548, Standard Guide for General Criteria Used for Evaluating Laboratory Competence.

B. Caltrans Standard Specifications:
   1. Section 24-2, Lime Stabilized Soil.
   2. Section 25, Aggregate Subbases.
   3. Section 26, Aggregate Bases.
   4. Section 27, Cement Treated Bases.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS.

A. 02 40 00 – Demolition

B. 31 20 00 – Earthwork

C. 31 23 33 – Trenching and Backfilling

1.04 DEFINITIONS

A. Geotechnical Testing Agency: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock definition testing, as documented according to ASTM D 3740 and ASTM E 548.

B. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material ¾-cubic yards or more in volume that when tested,

according to ASTM D 1586, exceeds a standard penetration resistance of 100 blows/2-inches.

C. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man made stationary features constructed above or below grade.

D. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, base or topsoil materials.

1.05 SUBMITTALS

A. Follow submittal procedures outlined in Division 01 Specifications.

B. Submit material certificates signed by the material producer and the Contractor, certifying that that each material item complies with, or exceeds the specified requirements.

1.06 QUALITY ASSURANCE

A. Percentage of compaction specified shall be the minimum acceptable. The percentage represents the ratio of the dry density of the compacted material to the maximum dry density of the material as determined by the procedure set forth in ASTM D 1557.

B. Do not mix or place cement treated base when the temperature is below is below 36 degrees F or when the ground is frozen.

C. Finish surface of material to be stabilized prior to lime treatment shall be as specified in Section 24-2.01D(1)(a) of Caltrans Standard Specifications.

D. Finish surface of the stabilized material after lime treatment shall be as specified in Section 24-2.03F of Caltrans Standard Specifications.

E. Finish surface of cement treated base shall be as specified in Section 27 of Caltrans Standard Specifications.

F. Do not project the finish surface of aggregate subbase above the design subgrade.

G. Finish grade tolerance at completion of base installation: +0.05’

1.07 PROJECT CONDITIONS

A. Protect open excavations, trenches, and the like with fences, covers and railings to maintain safe pedestrian and vehicular traffic passage.

B. Temporarily stockpile material in an orderly and safe manner and in a location approved by the Owner.

C. Provide dust and noise control in conformance with Division 1 General Requirements.

PART 2 PRODUCTS

2.01 AGGREGATE SUBBASE: REFER TO GEOTECTNICAL REPORT

A. Material: Caltrans Standard Specification Section 25.
   1. Class 1, 2, or 3: Section 25-1.02B.
   2. Class 4: Section 25-1.02C.
   3. Class 5: Section 25-1.02D.

2.02 AGGREGATE BASE

A. Material: Caltrans Standard Specification Section 26.
   1. Class 2, 1-1/2-inch Maximum: Section 26-1.02B.
   2. Class 2, 3/4-inch Maximum: Section 26-1.02B.
   3. Class 3: Section 26-1.02C.

2.03 CEMENT TREATED BASE

A. Materials: Caltrans Standard Specification Section 27-1.02.

2.04 LIME STABILIZATION

A. Lime Treatment Material: Conform to Section 24-2.03B and 24-2.03C of Caltrans Standard Specifications.

PART 3 EXECUTION

3.01 GENERAL

A. Placement and compaction of material by flooding, ponding, or jetting will not be permitted.

3.02 WET WEATHER CONDITIONS

A. Do not place or compact subgrade if above optimum moisture content.

3.03 AGGREGATE SUBBASE

A. Spreading and Compacting: Sections 25-1.03D and 25-1.03E of Caltrans Standard Specifications.

3.04 AGGREGATE BASE

A. Spreading and Compacting: Section 26-1.03D and 26-1.03E of Caltrans Standard Specifications.

3.05 DISPOSAL

A. Lawfully dispose of all unsuitable and excess or surplus material off-site at no cost to the Owner.

END OF SECTION

SECTION 321123 – PERMEABLE BASE FOR SYNTHETIC TURF SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION

A. Furnish all labor, materials, equipment, facilities, transportation and services to complete all work related to installing the permeable base for synthetic turf system as shown on the Drawings and/or specified herein.

B. The Contractor's scope of work includes site preparation, excavation, disposal of excess or unsuitable material, subgrade grading, installation of subsurface drain pipe and perimeter header, and the selection, purchase, grading and compaction of permeable material in accordance with the lines, grades, and cross-sections shown on the drawings. The extent of the work is shown on the Drawings and includes, but is not necessarily limited to, the following:

1. Ledger
2. Drain Pipe System
3. Geotextiles
4. Crushed Permeable Stone

1.02 QUALITY ASSURANCE

A. Reference Standards - ASTM: American Society for Testing and Materials.

B. Contractor's Materials Testing Agency Qualifications: An independent testing agency qualified to conduct soil materials and rock-definition testing that complies with ASTM E329 or D3740 and has personnel with at least 5 years of experience performing the following ASTM standard test methods and practices;

1. D75: Standard Practice of Sampling Aggregates.
2. C125: Standard Terminology Relating to Concrete and Concrete Aggregates
3. C131: Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
4. C136: Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
5. C702: Standard Practice for Reducing Samples of Aggregate to Testing Size.
6. D1557: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
7. D2434: Standard Test Method for Permeability of Granular Soils (Constant Head).
8. D4253: Standard Test Methods for Maximum Index Density and Unit

Weight of Soils Using a Vibratory Table.

9. D5821: Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate

C. Owner's Testing Agency shall review Contractor's submittals under this specification and recommend action as defined under the General Conditions.

D. The Owner shall reject material delivered to the site not meeting specifications. All material rejected by the Owner shall be removed from the site and replaced with suitable material at the Contractor's expense.

1.03 SUBMITTALS

A. Submittals prior to installation:

1. Submit five (5) copies of product data on pipe, pipe accessories, filter fabric and separation fabric.
2. Submit five (5) copies of certification signed by Contractor's Materials Testing Agency stating they meet the qualifications presented in Article 1.2.B - Quality Assurance.
3. CalTrans Class 1B permeable material: submit five (5) copies of certification signed by Contractor's Rock Manufacturer stating material supplied to the project meets the requirements as specified in the Standard Specifications.
4. Permeable Stone: The following items shall be submitted as a complete package. Failure to submit all items listed below will result in the submittal being returned to the Contractor as incomplete.
   a) Submit one (1) sample each, sealed five-gallon container of permeable stone.
   b) Submit five (5) copies of certification signed by Contractor's Rock Manufacturer stating that the submittal samples where prepared and tested within the last 60 days by the rock manufacturer and meet the gradation requirements specified in Paragraph 2.06. Certification shall list specified gradation requirements and show results of gradation test conducted in accordance with ASTM C136.
   c) Submit five (5) copies of report signed by Contractor's Materials Testing Agency certifying that submittal samples meet all specified requirements as listed in Paragraph 2.06, CRUSHED STONE. The report must present test results performed in accordance with the following ASTM standard test methods and practices:
      i) C131: Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

ii) C136: Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

iii) D2434: Standard Test Method for Permeability of Granular Soils (Constant Head).

iv) D4253: Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

d) Additional reporting requirements for this submittal:

i) Description of ASTM D2434 testing apparatus and procedure used to prepare samples for testing.

B. Submittals during construction:

1. For every 600 tons of permeable material produced, submit five (5) copies of certificate of compliance signed by Contractor stating that a quality control sample was collected, prepared, and tested by the Contractor's Rock Manufacturer and/or Contractor's Materials Testing Agency and meets the specified gradation requirements. Certification shall report specified gradation requirements and results of gradation test conducted in accordance with ASTM C136. This submittal shall be received and approved by the Owner prior to delivery of the material to the site.

2. Submit certification signed by the Contractor's Synthetic Turf Installer stating that they have visited the site and observed the initial placement and compaction of top rock and find the surface suitable to install the synthetic turf. This submittal shall be received and approved by the Owner prior to acceptance of the work.

1.04 MATERIAL TESTING AND INSPECTION DURING CONSTRUCTION

A. The Owner’s Testing Agent will be present intermittently to observe the Contractor's operation, to perform tests and measurements. Such observations, tests, measurements shall not alter the requirements of the drawing or specifications nor imply any superintendence or control of the Contractor’s operation, nor warranty the Contractor’s work.

B. Submittal samples shall be held by Owner’s Testing Agent for possible testing until completion of construction.

C. During construction, the Contractor shall perform his own inspection of and testing by Contractor's Materials Testing Agency or Rock Manufacturer on rock materials to the degree he deems necessary for him to assure compliance of the rock materials with the specifications. This inspection and testing shall be in addition to that which is specifically required by this specification.

D. Contractor's Materials Testing Agency shall be required to conduct the following tests during construction:

If ASTM C136 test results conducted by the Contractor's Rock Manufacturer on a quality control sample as defined in Article 1.04 indicates a difference of 10% or greater from the test results of the approved permeable submittal sample, ASTM D2434 testing shall be conducted on the material to confirm that the material meets the minimum permeability requirement.

E. The Owner's Testing Agent shall periodically inspect and/or obtain samples of rock materials at the source and/or as they are delivered to the site. Any rock material that does not conform to the approved submittal samples will be rejected immediately or tested by the Owner's Testing Agent to verify compliance with the specifications. Such tests shall imply no warranty of the Contractor's work or compliance with the specifications.

1. Costs for initial rock material testing by the Owner's Testing Agent are the responsibility of the Owner. Costs for any rock material testing by the Owner's Testing Agent on rock materials that are a replacement for rock materials that were rejected by the Owner's Testing Agent due to nonconformance with the specifications, Contractor's submittals or quality control test results, will be borne by the Contractor and may be invoiced to the Contractor by the Owner or deducted from the next Progress Payment.

F. The Owner's Testing Agent shall conduct the following tests during construction:

1. Laboratory and field testing (ASTM D4253 and D2167, D2922, or D3017) to determine density of compacted rock materials.

2. Field percolation testing at four to six locations on the completed top rock surface to confirm a minimum percolation rate of 40 in/hr.

1.05 SITE CONDITIONS

A. The Contractor shall satisfy himself as to the nature and quantity of materials to be moved and other work to be performed, and shall notify the Owner of any differences between site conditions shown on the drawings and actual conditions prior to commencement of work.

PART 2 PRODUCTS

2.01 HEADER (LEDGER, NAILER BOARD)

A. The header will be used by the turf system installer as a means of attaching the turf carpet along the edges of the turf system at the locations shown on the drawings.

B. The header shall be 2x 4 TREX brand wood-polymer lumber, or approved equal.

C. The header shall be attached to concrete curbing using concrete anchor bolts, sized and spaced according to the drawings.

2.02 DRAINAGE PIPE: REFER TO PLAN AND SECTION 334000, STORM DRAINAGE UTILITIES

2.03 NONWOVEN GEOTEXTILE

A. Nonwoven geotextile (Filter Fabric) placed in the subsurface drainage trenches shall conform to the following specifications.

Mechanical Properties	Test Method	Unit	Min. Avg. Roll Value
Grab tensile strength	ASTM D4632	lbs	120(MD), 120(CD)
Grab tensile elongation	ASTM D4632	%	50(MD), 50(CD)
Trapezoid tear strength	ASTM D4533	lbs	45(MD), 45(CD)
Mullen burst strength	ASTM D3786	psi	225
Puncture strength	ASTM D4833	lbs	65
Apparent opening size	ASTM D4751	mm	0.20
Permittivity	ASTM D4491	sec^{-1}	1.5
Flow rate	ASTM D4491	$gal/min/ft^2$	130

2.04 WOVEN GEOTEXTILE

A. Woven geotextile (Separation Fabric) placed on the subgrade shall conform to the following specifications.

Mechanical Properties	Test Method	Unit	Min. Avg. Roll Value
Tensile Strength (ultimate)	ASTM D4595	lbs/in	2000(MD),1500(CD)
Grab tensile strength	ASTM D4632	lbs	250(MD), 250(CD)
Grab tensile elongation	ASTM D4632	%	20(MD), 20(CD)
Trapezoid tear strength	ASTM D4533	lbs	100(MD), 100(CD)
Mullen burst strength	ASTM D3786	psi	450
Puncture strength	ASTM D4833	lbs	120
Apparent opening size	ASTM D4751	mm	0.30

Permittivity	ASTM D4491	sec^{-1}	0.40
Flow rate	ASTM D4491	$gal/min/ft^2$	30

2.05 CRUSHED PERMEABLE STONE

A. Drainage Trench Rock shall be crushed stone conforming to the requirements for CalTrans Class 1B permeable material.

B. Permeable stone for the synthetic turf shall be permeable crushed angular stone conforming to the following requirements:

1. Gradation Requirements (ASTM C136):

   a) Maximum particle size: 3/4"
   b) Maximum percent passing #200 sieve:

2. Drainage Requirements (ASTM D2434):

   a) Laboratory Permeability > 500 in/hr (1.75X cm/sec^{-1}) [Test with 10 rock saturated and compacted between 92% and 100% of maximum per ASTM D4253]
   b) Field percolation rate of at least 40 in/hr.

3. Durability Requirements (ASTM C131):

   a) LA Abrasion (500 revs) < 40

C. Gradation Ranges: Permeable stone within the following ranges will generally meet the requirements listed above. This information is not a warranty, it is only intended to help guide the Contractor's Rock Manufacturer in the production of the materials.

Gradation	Permeable Stone
Sieve Size	Percent Passing
3/4"	100
1/2"	80 – 100
3/8”	50 – 80
No. 4	30 – 60
No. 8	20 – 40
No. 16	5 – 30
No. 30	0 – 10
No. 50/60	0 – 7

No. 100	0 – 4
No. 200	0 – 3

.

PART 3 EXECUTION

3.01 GENERAL:

A. Excavating and grading shall be performed in conformance with the alignment, grade and cross-sections indicated on the drawings.

3.02 SPILLAGE, DUST AND EROSION CONTROL:

A. The Contractor shall prevent spillage when hauling on or adjacent to any public street or highway. In the event that spillage occurs, the Contractor shall remove all spillage and sweep, wash or otherwise clean such streets in accordance with City, County and/or State requirements.

B. The Contractor shall take all precautions needed to prevent a dust nuisance to adjacent public and private properties and to prevent erosion and transportation of soil to downstream properties due to work under this contract. Any damage so caused by the Contractor's work shall be corrected or repaired by the Contractor.

3.03 SUBGRADE GRADING

A. The subgrade beneath the permeable base shall be prepared in accordance with the geotechnical report and Section 312000 - Earthwork.

3.04 COMPACTED FILL

A. Any fill material placed to create the planned subgrade shall be placed in accordance with the geotechnical report and Section 312000 - Earthwork.

3.05 SUBGRADE SLOPES AND TOLERANCES

A. Final subgrade grades shall conform to the lines and grades shown on the drawings.

B. The subgrade shall be excavated to create a positive slope towards the subsurface drain pipes. Unless otherwise specified on the drawings, the minimum slope of the subgrade shall be 1.0%.

C. The final subgrade grade shall be rolled with a smooth drum roller to remove all localized depressions deeper than ½ inch caused by construction and compaction equipment tires or rollers.

D. The measured grades shall not deviate more than 0.08 feet from the planned grades and not vary more than 0.04 feet in 10 feet in any direction. Laser

grading is recommended.

E. All subgrade grades shown on the drawings shall be completed by the Contractor and inspected by the Owner and Engineer prior to commencing with the subsequent work items.

F. A conformance survey, performed by a licensed surveyor, is recommended.

3.06 SUBSURFACE DRAINAGE SYSTEM

A. A system of shallow trenches shall be excavated to the lines, grades and dimensions shown on the drawings.

B. The excavated trenches shall be free of loose soil and debris.

C. A layer of filter fabric shall be placed in the shallow trench and backfilled with at least 2 inches of CalTrans Class 1B permeable material. A perforated drain pipe shall then be placed in the trench in accordance with the drawings. The pipe shall be laid with the perforations down and at a minimum slope of 0.5% unless otherwise specified on the drawings. Lengths of pipe shall be joined by fittings fabricated by the pipe manufacturer. The perforated drain pipe shall be covered with at least 2 inches of CalTrans Class 1B permeable material.

D. All trench rock backfill shall be placed in layers eight inches or less in loose thickness and densified to achieve at least 92% of the maximum density (ASTM D4253).

E. Solid pipe clean out risers with end caps shall be installed at locations designated on the drawings. The maximum allowable bend angle for the subdrain clean out is 45 degrees.

F. The perforated sub-drain pipes shall connect to a non-perforated discharge pipe. The discharge pipe shall connect into the storm water drainage system as shown on the drawings.

3.07 PERIMETER HEADER

A. The Contractor shall provide and install the header in accordance with the layout and details shown on the drawings. The header will be used by the turf system installer as a means of attaching the turf carpet along the edge of the fitness area.

3.08 GEOTEXTILE

A. A. Geotextile shall not be installed until a perimeter header has been installed.

B. Geotextile shall not be installed until subdrainage trenches have been excavated.

C. Geotextile rolls shall be handled in such a way that they are not damaged.

D. Geotextile shall be placed on exposed subgrade surfaces if shown on the drawings. The geotextile shall be rolled out parallel to the long direction of the fitness area.

E. Geotextile shall be securely anchored and then rolled in such a manner as to continually keep the geotextile sheet in tension.

F. Geotextile seams shall be anchored using 60d nails through 1-1/2" round washers placed at 36 to 48 inches on center during placement. Additional anchoring shall be installed as required to prevent bunching of the geotextile.

G. Adjacent widths of geotextile shall be "shingled" and have a 6-inch overlap at all edges.

H. Holes or tears in the geotextile shall be repaired with a fabric patch spot-seamed with a minimum 24 inch overlap in all directions.

3.09 PERMEABLE STONE

A. The specified permeable stone shall be carefully placed and compacted over the subgrade to the grades and elevations shown on the drawings. If the thickness of the planned permeable stone exceeds 6 inches, the rock shall be placed in horizontal layers not exceeding 8 inches and each layer compacted to 92% of the maximum density with a vibratory smooth drum roller.

B. The top of the permeable stone shall be carefully placed using a self-propelled paving machine in order to minimize segregation. Alternative placement methods may be proposed by the Contractor. The Owner may approve these methods provided the Contractor can, to the satisfaction of the Owner, present a history of successful use on past projects and by constructing a representative test area using these methods that shows these methods do not result in significant segregation.

C. The Contractor's Synthetic Turf Installer shall observe the initial placement and compaction of permeable stone in a trial area and determine whether the surface is suitable to install the synthetic turf. The Contractor shall modify installation procedures and/or material used until the Contractor's Synthetic Turf Installer is satisfied.

D. Should any segregation of the material occur, during any stage of the stockpiling, spreading or grading, the Contractor shall immediately remove and dispose of segregated material and correct or change handling procedures to prevent any further separation.

E. Finished surface shall be proof rolled to 92% of the maximum density with a vibratory smooth drum roller to provide a non-yielding, smooth, flat surface.

F. Final permeable stone grades shall conform to the lines and grades shown on the drawings. The measured grades shall not deviate more than 0.04 feet from the planned grades and not vary more than 0.02 feet in 10 feet in any

direction. Laser grading is recommended.

G. The surface of the permeable shall be sloped as shown on the drawings.

H. Permeable stone grades shall be completed by the Contractor and inspected by the Owner and Engineer prior to commencing with the subsequent work items.

I. A conformance survey, performed by a licensed surveyor, is recommended.

J. Field percolation testing shall be conducted by the Owner's Testing Agent in accordance with Section 1.04.F.2. The Contractor shall correct the top rock layer, at no cost to the Owner, if the minimum percolation requirement is not achieved.

3.10 FINISHING OF SURFACE PLANARITY

A. Finish surface planarity shall be adjusted by the Contractor using the string line method. A mason's line held taught between two workman separated by a distance of approximately 40 feet, shall be placed directly on the finished rock surface, parallel to the long axis of the field. A third workman shall check for separations between the mason's line and the finished surface that are equal to or greater than the tolerances specified in 3.10-F. The entire finished surface shall be checked with the mason's line in increments no greater than 3 linear feet. Areas of separation shall be identified with marking paint and the depth of separation indicated.

B. Areas identified with marking paint shall be filled with top rock to the depth indicated and raked by hand. Filled areas shall be compacted to 92% of the maximum density to provide a non-yielding, smooth, flat surface.

C. The entire finished surface shall be rechecked using the method described in 3.11-A and 3.11-B along the short axis of the field.

D. Roller marks, tire tracks, footprints or other impressions on the finished surface shall be raked out where they are equal to or greater than the tolerances specified in 3.10-F.

E. Following long and short axis checking and corrections, the Contractor shall notify the Owner that the finished surface is ready for inspection.

F. The Contractor shall perform a final string line check along the long axis of the field in the presence of the Owner and Contractor's Synthetic Turf Installer. Finished surface planarity shall be approved by the Owner prior to installation of synthetic turf system.

G. Damage to the finished surface planarity occurring after approval shall be corrected by the Contractor using the method described in 3.10-A and 3.10-B.

END OF SECTION

SECTION 321200 - FLEXIBLE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prime coat.

B. Tack coat.

C. Asphaltic concrete paving.

D. Asphaltic concrete overlay and slurry seals.

E. Pavement grinding.

1.02 RELATED DOCUMENTS

A. ASTM:

1. D 979: Standard Practice for Sampling Bituminous Paving Mixtures.
2. D 1073: Standard Specification for Fine Aggregate for Asphalt Paving Mixtures.
3. D 1188: Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples.
4. D 2041: Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.
5. D 2726: Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Asphalt Mixtures.
6. D 2950: Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
7. D 3549: Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
8. D 3666: Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Mixtures.

B. Caltrans Standard Specifications.

1. Section 37: Bituminous Seals.
2. Section 39: Asphalt Concrete.
3. Section 96: Geosynthetics.
4. Section 92: Asphalt Binders.
5. Section 94: Asphaltic Emulsions.

C. California Building Code:
1. Chapter 11B – Accessibility to Public Buildings, Public Accommodations, Commercial Buildings, and Public Housing.
2. Section 1110A – Exterior Accessible Routes.

D. GEOTECHNICAL INVESTIGATION AND GEOLOGICAL HAZARD EVALUATION REPORT FOR THE PROPOSED SPORTS FIELD RENOVATION CONSTRUCTION PROJECT, TENAYA MIDDLE SCHOOL, 760 WEST 8th STREET, MERCED, CALIFORNIA by Visha Consultants Inc. Dated: 06/06/2025, Project No. 25-0109

1.03 DEFINITIONS

A. ASTM: American Society for Testing Materials.

1.04 QUALITY ASSURANCE

A. Testing Agency: Owner will engage a qualified independent testing agency to perform field inspections and tests 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.

B. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.

C. Thickness of Asphaltic Concrete: In-place compacted thickness of asphalt courses will be determined according to ASTM D 3549.

D. Surface Smoothness: Finished surface of each asphalt course will be tested for compliance with smoothness tolerances.

E. In-Place Density: Samples of uncompacted paving mixtures and compacted pavement will be secured by testing agency according to ASTM D 979.

1. Reference maximum theoretical density will be determined by averaging results from 4 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 may be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

(a) One core sample may be taken for every 1000 sq. yd. or less of installed pavement, but in no case will fewer than 3 cores be 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.

1.05 SUBMITTALS

A. Follow submittal procedures outlined in Division 01 Specifications.

B. Job-Mix Designs: Certificates signed by manufacturers certifying that each asphaltic concrete mix complies with requirements.

C. Material Certificates: Certificates signed by manufacturers certifying that each material complies with requirements.

1.06 PROJECT CONDITIONS

A. Environmental Limitations:

1. Prime Coat: Minimum surface temperature of 60 deg F at application.
2. Tack Coat: Minimum surface temperature of 60 deg F at application.
3. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at application.
4. Asphalt Surface Course: Minimum surface temperature of 60 deg F at application.
5. Reinforcing Fabric: Air temperature is 50 deg F and rising and pavement temperature is 40 deg F and rising.

PART 2 PRODUCTS

2.01 ASPHALTIC CONCRETE

A. Caltrans Standard Specifications Section 39, Type B.

B. Asphalt Materials:

1. Asphalt: Caltrans Standard Specification Section 92, steam refined paving asphalt.
   (a) Asphalt Curbs: use grade PG 70-10
   (b) All other asphalt products: use grade PG 64-10.
2. Prime Coat: Caltrans Standard Specification Section 93, SC-70.
3. Tack Coat: Caltrans Standard Specification Section 94, SS1.
4. Asphaltic Emulsion: Caltrans Standard Specification Section 94, quick-setting type, Grade QS1h anionic or CQS1h cationic.

C. Aggregates: Conform to Caltrans Standard Specification Sections 37-3.02B(2) and 39-2.02 as applicable.

D. Storing, Proportioning and Mixing Materials: Caltrans Standard Specification Section 39-3.

E. Pavement Reinforcing Fabric: Caltrans Standard Specification Section 96.

F. Sand: ASTM D 1073, Grade No. 2 or 3.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.

B. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.

C. Notify Owner in writing of any unsatisfactory conditions. Do not begin paving until these conditions have been satisfactorily corrected.

3.02 PAVEMENT GRINDING

A. Clean existing paving surface of loose or deleterious material immediately before pavement grinding.

B. Grind conforms as indicated.

3.03 SOIL STERILANT

A. Furnish and apply to areas indicated in accordance with Section 31 31 19 – Vegetation Control.

3.04 SURFACE PREPARATION FOR AGGREGATE BASE MATERIALS

A. General: Immediately before placing asphalt materials remove loose and deleterious material from substrate surfaces and ensure that prepared subgrade is ready to receive paving according to the Caltrans Standard Specification Section 39-4.01.

B. Prime Coat: Apply uniformly over surface of compacted-aggregate base according to the Caltrans Standard Specification Section 39-4.02. Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure for 24 hours minimum.

1. If prime coat is not entirely absorbed within 8 hours after application, spread excess prime coat with hand tools and broadcast sand over surface to blot excess asphalt. Use just enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

C. Tack Coat: Apply uniformly to all vertical surfaces against which asphaltic concrete is to be placed, including existing surfaces of previously constructed asphalt or portland cement concrete paving and to surfaces abutting or projecting into new asphalt pavement, according to the Caltrans Standard Specification Section 39-4.02.

1. Allow tack coat to cure undisturbed before paving.

2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.05 SURFACE PREPARATION FOR PAVEMENT AT ASPHALTIC CONCRETE OVERLAYS AND SLURRY SEALS

A. Pavement Irregularities: Level with asphaltic concrete, Type B, No. 4 maximum.

B. Pavement Cracks:

1. Less than 1/8-inch wide: Clean of all dirt by compressed air jet, spray and seal with RS-1 asphaltic emulsion.
2. Wider than 1/8-inch: Clean of all dirt by compressed air jet, spray and seal with RS-1 asphaltic emulsion and skin patch.

C. Clean surface of all material, such as leaves, dirt, sand, gravel, water and vegetation including roots prior to applying binder of paving asphalt to existing surface.

D. Oil spots shall be removed with brush and detergents and covered with Oil Spot Sealer by OverKote or an equal product.

E. Prior to first application in exceptionally hot weather, dampen surface with water. Remove excess water and leave surface slightly damp.

3.06 APPLYING ASPHALT PAVEMENT OVERLAYS AND SLURRY SEALS

A. Use OverKote Asphalt Pavement Coating or equal product.

B. Apply at a rate of 25 gallons per 1,000 sf of surface area.

C. Follow all manufacturers' recommendations for preparation and applications procedure of the products used.

D. Apply second coat as soon as first coat is dry.

3.07 PAVEMENT REINFORCING FABRIC

A. Protect from exposure to ultraviolet rays until placed.

B. Reject rolls with broken or damaged cores, or factory wrinkled fabric that prevents wrinkle free placement.

C. Place with binder of paving asphalt in accordance with Section 39-4.03 of Caltrans Standard Specifications.

3.08 ASPHALTIC CONCRETE SPREADING AND COMPACTING EQUIPMENT

A. Spreading Equipment: Caltrans Standard Specification Section 39-5.01.

B. Compaction Equipment: Caltrans Standard Specification Section 39-5.02.

3.09 ASPHALTIC CONCRETE PLACEMENT

A. Place, spread and compact asphaltic concrete to required grade, cross section, and thickness according to the Caltrans Standard Specification Sections 39-6.01, 39-6.02 and 39-6.03.

B. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.10 JOINTS

A. Construct joints to ensure continuous bond between adjoining paving sections according to the Caltrans Standard Specification Sections 39-6.01 and 39-6.02.

1. Construct joints free of depressions with same texture and smoothness as other sections of asphalt course.
2. Clean contact surfaces and apply tack coat.
3. Offset longitudinal joints in successive courses a minimum of 6 inches.
4. Offset transverse joints in successive courses a minimum of 24 inches.
5. Compact joints as soon as asphaltic concrete will bear roller weight without excessive displacement.

3.11 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact according to the Caltrans Standard Specification Sections 39-6.01 and 39-6.03.

B. Compaction Requirements: Average Density to be 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.

C. Finish Rolling: Finish roll paved surfaces to remove roller marks while asphalt is still warm.

D. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while still hot, with back of rake or smooth iron. Compact thoroughly using tamper or other satisfactory method.

E. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh asphalt. Compact by rolling to specified density and surface smoothness.

F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.12 INSTALLATION TOLERANCES

A. Asphalt Pavement:

1. Course thickness and surface smoothness within the tolerances in the Caltrans Standard Specification Sections 39-6.01, 39-6.02 and 39-6.03.
2. Total Thickness: Not less than indicated.

B. Trench Patch:

1. Compacted surface: Within 0.01 foot of adjacent pavement.
2. Do not create ponding.

END OF SECTION

SECTION 32 12 16.10 TRACK ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Provide asphalt pavement, including aggregate base course and materials as required for complete finished paving system.

B. Related Sections:

1. Section 31 20 00: Earthwork

1.2 REFERENCES

A. Standard Specifications: The Standard Specifications of the State of California, Business and Transportation Agency, Department of Transportation, current edition.

B. The Asphalt Institute: Asphalt Paving Manual,

C. Geotechnical report dated 06.05.2025 by Visha Consultants

D. American Sports Builders Association asphalt guidelines, https://sportsbuilders.org/page/asphalt_guidelines

1.3 PROJECT CONDITIONS

A. Do not install pavement during inclement weather or when air temperature is below that recommended by Standard Specifications or The Asphalt Institute (AI) MS-8.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Paving Asphalt: Paving asphalt to be mixed with aggregate shall be steam-refined asphalt, PG 70-22, or PG 64-22 per local climate, conforming to Section DOT Standard Specifications (current edition).

1. Aggregates:
   a. Aggregates, mineral filler, and asphalt binder shall meet or exceed the requirements of local specifications for asphalt pavements placed under this contract for qualities and types. The coarse aggregate shall be sound, angular crushed stone, crushed gravel, or crushed air-cooled blast furnace slag (not steel). The fine aggregate shall be well graded, moderately sharp to sharp (angular) sands. No aggregates known to cause rust spots or pop-outs (steel slag, iron pyrite, and / or dust balls) are allowed in the asphalt. No recycled concrete is allowed in any of the asphalt mixtures. Aggregate for a Track asphalt paving shall consist of ½ inch maximum medium per DOT Standard Specifications (current edition).

b. Target laboratory air voids = 3.5% Max.

c. All HMA mix designs shall be performed in accordance with the Asphalt Institute Manual Series #2 (MS-2), current edition. The HMA mix designs developed shall meet the requirements of one of the following for compactive effort in the laboratory:
   1) Marshall, 50-Blow,
   2) Superpave, 50-Gyration, or

Mix Design Method Requirements

Measures	**Superpave**	**Marshall**	**Hveem**
Stability, lbs.	n/a	1,200 min.	30 min.
Flow, 0.01 in.	n/a	8 to 16	n/a
Swell, in.	n/a	n/a	0.030 max.
Air Voids @ optimum AC with 2-hr. aging (cure-time).	3.5%	3.5%	3.5%
VMA based on NMAS			
#4 (4.75 mm)	16.0 min.	16.0 min.	16.0 min.
⅜" (9.5 mm)	15.0 min.	15.0 min.	15.0 min.
½" (12.5 mm)	14.0 min.	14.0 min.	14.0 min.
¾" (19.0 mm)	13.0 min.	13.0 min.	13.0 min.
VFA	73 to 80	73 to 80	73 to 80
Dust to effective AC (design & production)	0.7 to 1.3	0.7 to 1.3	0.7 to 1.3
Tensile Strength Ratio	80% min.	80% min.	80% min.

d. Base mixes shall have a minimum of 45% passing the #4 sieve,

e. Surface and leveling mixes shall have a minimum of 45% passing the #8 sieve.

f. Coarse Aggregate fraction shall have a minimum of 85% / 75% crushed faces,

g. Fine Aggregate Angularity (AASHTO T-304, Method A), shall be >= 40% with no more than 20% natural sand allowed,

h. Mix Designs shall include a breakdown factor, increase to minus #200, introduced during the design stage to mimic production values,

i. VMA is based on the aggregate bulk (dry) specific gravity, Gsb, as determined by AASHTO T-84 and T-85,

j. Performance Graded (PG) binder shall meet typical agency specification for new construction low volume roadways, [Reference LTPPBind, current edition; 98% reliability.]

k. Reclaimed Asphalt Pavement (RAP):
   1) Reclaimed Asphalt Pavement is not allowed in athletic facilities asphalt.

l. Current Quality Control testing of the mixture, aggregates, and RAP proposed to be used on the project shall be submitted to the Owner prior to acceptance of the proposed mix design.

B. Asphalt Cement: Comply with Standard Specifications for type of paving indicated, but no less than AR 4000, Type B aggregate, and AASHTO M226/ASTM D3381; minimum Viscosity Grade AC-20, AR-80.

C. Primer: AASHTO M82/ASTM D2027 MC 70; homogeneous medium curing liquid asphalt; of type recommended for asphaltic paving; of grade to suit job conditions.

D. Tack Coat: Standard Specifications or AASHTO M140/ASTM D977 SS1h type asphalt emulsion diluted with water.

E. Aggregate Base: Virgin Class 2, 3/4" maximum particle size; sound, angular crushed stone, crushed gravel. No RAP allowed

2.2 MIXES

A. Provide asphalt-aggregate mixture as recommended by Standard Specifications, Section 39, Type A; maintain thorough and uniform mixture.

B. Bring asphalt cement and mineral constituents to required temperatures before mixing; ensure aggregates are sufficiently dry so as not to cause foaming in mixture.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Ensure buried work in paved areas has been completed, inspected, tested and approved prior to starting work.

B. Ensure grading of sub-grade is to required elevations.

3.2 PREPARATION

A. Where not previously excavated, thoroughly scarify pavement sub-grade to a minimum depth 12" and compact to 95% dry density.

   1. Prepare sub-grade to provide optimum moisture content.

      a. Water and thoroughly mix sub-grade when deficiency exists.

      b. When excess of moisture exists, rework and aerate sub-grade.

B. Before final rolling shape entire section add additional sub-soil as required and compact sub-grade to provide grades, elevation and cross-section indicated.

1. Points of finished sub-grade surface shall be within 1" of elevations indicated.

3.3 INSTALLATION

A. Aggregate Base Course:

1. Bring aggregate base course to required depths and profiles.

a. Extend minimum 6" beyond asphalt pavement width.
b. Place in layers not exceeding 5" in depth.
c. Compact each layer to 95% dry density unless otherwise indicated.

2. Properly compact areas adjacent to curbs and areas not accessible to rollers with mechanical or hand tamping devices.

3. Ensure aggregate base course materials are not contaminated with deleterious materials.

4. Spread base course materials over prepared sub-base.

a. Depth: As indicated on Drawings.

5. Compaction: Minimum of 95% dry density unless otherwise indicated.

6. Ensure top surface of base course is true to lines and grades indicated, within 1/2" of elevations indicated.

7. Add water during compaction to bring aggregate base course materials to optimum moisture content.

8. When excess moisture exists, rework aggregate base course materials until optimum moisture content is obtained.

B. Priming Prepared Aggregate Base Course: Ensure aggregate base course is dry and free of loose or foreign material before priming.

1. Apply primer over prepared aggregate base course at rate recommended by Standard Specifications and manufacturer's recommendations; ensure primer is at temperature recommended by manufacturer.

a. Use clean natural sand to blot excess primer.

2. Prime surfaces of curbs in contact with asphalt pavement.

3. Prevent asphalt adhesion to adjacent materials.

C. Tack Coat: Apply liquid asphalt tack coat to vertical surfaces asphaltic concrete will be placed against; comply with Standard Specifications and manufacturer recommendations.

D. Asphaltic Concrete Pavement: Place asphalt pavement within 24 hours of priming aggregate base course.

E. Ambient Air Temperate should be 50 degrees and rising prior to placing

F. Depths: As indicated on Drawings. Self-propelled rollers are required as compaction equipment. Towed-type rollers should not be used. Hand-held or vibrating plate compactors can be used in small, inaccessible areas. Steel-wheeled non-vibrating rollers shall have a mass of 10 tons (9 metric tons). Steel wheeled vibrating rollers shall have a mass of 5 tons (4.5 metric tons). Pneumatic tired multi-wheeled rollers shall not be used.

G. The hot mix asphalt shall be placed with a minimum delay after delivery. On no account shall hot mix asphalt be reheated.

H. The entire athletic surface course shall be paved on the same day. The timing and process should be discuses with and approved by the owner proceeding with the work.

I. Hot mix asphalt shall be spread to a depth consistent with the specified compacted thickness. Each layer shall be completed to a surface parallel to the finished surface of the pavement and at a depth below it equal to the compacted thickness of the subsequent layer or layers specified.

J. Hot mix asphalt shall not be placed during rain, or when the air temperature in the shade and away from artificial heat is 40°F (5°C) or less, or while the surface is wet or when the pavement temperature does not comply with the Table below:

Pavement Surface Temperature in shade	Minimum Laying Temperatures Binder Course	Minimum Laying Temperatures Top Coat
40°F - 50°F (5°C - 10°C)	302°F (150°C)	293°F (145°C)
50°F - 60°F (10°C - 15°C)	293°F (145°C)	284°F (140°C)
60°F - 77°F (15°C - 25°C)	284°F (140°C)	275°F (135°C)
Over 77°F (Over 25°C)	275°F (135°C)	266°F (130°C)

K. Maximum laying temperature of the mixture shall be 325°F (163°C)

L. The temperature of the mix shall be measured in the truck just prior to discharging into the paver hopper. A suitable stem type thermometer shall be used. The stem shall be inserted into the mix to a depth of approximately 8" (200mm) at a location at least 12"(300mm) from the side of the truck body. An average of at least two readings shall be adopted as the temperature of the mix.

M. Compaction: Compact asphalt paving with approved rolling equipment; start compaction as soon as pavement will bear equipment without checking or undue displacement. Two rollers shall be used at a minimum. Three rollers shall be required when tonnage is greater than 300 tons/day.

N. The exact number of passes of a roller that will be required to obtain adequate density will be determined on a test strip using a nuclear density gauge to measure the density of the mat after each pass, until maximum achievable density is indicated

by the test results. The rolling pattern used on the test strip should be the same that will be used on the remainder of the job. The number of rollers and/or the rate of production will be adjusted accordingly.

O. The speed of rollers at all times shall be slow enough to avoid displacement of the mix and shall not be greater than 3 miles/h (5 km/h)

P. Steel wheel rollers shall be operated with minimum wetting of rollers.

Q. Vibratory mechanisms shall be disengaged before stopping or reversing direction

R. Rollers shall not remain stationary on asphaltic concrete while it is still warm. Roller wheels shall be kept free from any build-up.

S. The roller shall pass over the unprotected end of the freshly laid mixture only when a transverse joint has to be made.

T. Initial (breakdown) rolling shall be performed with a static steel-wheeled roller. Transverse joints shall be rolled first, then the longitudinal joint and the outside edge. Breakdown rolling shall continue longitudinally, commencing on the lower side and proceeding to the higher side of the spreader run. The roller shall overhang the unsupported edges of the run by about 4-inch (100mm). Each longitudinal pass shall overlap the previous pass by about 4-inch (100mm) and adjacent passes of the roller shall be of different lengths.

U. Secondary rolling to obtain required density before the mixture cools to 185°F (85°C) shall be performed as soon as possible after initial rolling and shall be performed with a static or a vibratory steel wheeled roller. Rolling shall be carried out longitudinally commencing on the lower side and proceeding to the higher side of the spreader run. Each roller pass shall overlap the previous ass and adjacent passes shall be of different lengths.

V. Final rolling for the improvement of the surface while the mixture is still warm enough to permit removal of any roller marks shall be performed with static steel wheeled roller.

W. When paving in echelon, the edge of the run common to adjacent spreaders shall be left unrolled for a width of 8 inch (200mm) until the longitudinal joint has been constructed. This strip shall be rolled together with the edge of the adjacent spreader run. Rolling shall commence before the temperature of the material along the edge of the first spreader run has fallen below 95°C (203°F)

X. Ensure joints made during paving operations are straight, clean, vertical and free of broken or loose material; prime vertical surfaces of joints to ensure tight bond.

Y. Ensure surface of completed asphalt pavement is true to lines, profiles, and elevations indicated.

Z. Ensure finish surface is free of depressions exceeding 1/8" when measured with a 10'-0" straight-edge.

3.4 PATCHING

A. Remove and replace defective paving areas and paving areas mixed with foreign materials.

B. Cut out areas and fill with fresh, hot asphaltic concrete; compact by rolling to maximum surface density and smoothness.

3.5 FIELD QUALITY CONTROL

A. Site Tests and Inspection: Allow for testing and inspection of asphalt pavement mixes and testing of placed aggregate base course and asphalt pavement; refer to General Conditions testing laboratory services.

1. Testing and inspection will be performed so as to minimize disruption to work.

2. Allow testing laboratory access to mixing plant for verification of weights or proportions, character of materials used and determination of temperatures used in preparation of paving mix.

3. When required, testing laboratory will perform laboratory tests of proposed asphalt pavement mixes to determine conformity with requirements.

4. Testing laboratory will perform one series of compaction tests for aggregate base course and for each asphalt pavement course.

5. Notify testing laboratory to perform density tests when aggregate base course or portion thereof has been placed and compacted in accordance with requirements,

    a. Do not place asphalt pavement until results have been verified and base course installation approved.

6. Testing required to validate or control the mix supplied is the Paving Contractor's responsibility and will be included in the bid cost for providing these HMA items. Daily maximum theoretical specific gravity (Gmm) values must be made available to the Contractor's density technician for verifying in-place density within four hours of start of production. Asphalt content, gradation, and bulk specific gravity (Gmb) testing shall be performed on the first day of installation for each product used, then done a minimum of once every 400 tons of HMA supplied or every third day for low tonnages that when added together successively do not equal 400 tons. Acceptable average measures are made by use of a correlated nuclear density gauge, a correlated Pavement Quality Indicator or PaveTracker (non-nuclear) or by cutting (4) cores per lift, per day and testing per AASHTO T-166, Method C. Additional testing shall be performed on any given day once 400 tons of asphalt is placed on that day.

7. The average sub-lot (daily or 400 tons; whichever is less) in-place density measure for surface course mixtures shall be minimum 94.0% of Gmm. Base and leveling installation of asphalt shall meet local DOT specifications for in-place density measures or average of 92.0% of Gmm, whichever is greater. Surface course longitudinal joints shall be measured directly upon the joint, centered upon by core or density gauge, and shall meet the mat density requirements. Base and leveling

course longitudinal joint density measures shall achieve between 95% - 102% of maximum achievable individually, with an average of 98% on any given day.

8. Process Control testing shall be in accordance with state standards for frequency and methods where the work being performed is done with a minimum of testing meeting the above QC requirements.

9. If compaction tests indicate aggregate base course or asphalt paving do not meet specified requirements, remove defective work, replace and retest with no additional cost to Owner.

10. Should a section of the work be not acceptable on the basis of inadequate compaction and/or the mixture became loose and broken, mixed with dirt or in any way defective, it shall be removed and replaced with fresh mixture which shall be immediately compacted to conform with the surrounding area.

11. Areas of one (1) square inch or more showing excess of bitumen shall be removed and replaced.

B. On completion of placement and compaction, pavement courses shall comply with the tolerances itemized as follows:

ITEM	CHARACTERISTIC	TOLERANCE
Top Coat	Level	+2mm / -2mm from design levels
	Thickness	+5mm / -0 mm from design thickness
	Flatness	3mm maximum departure from a 3m straight-edge in all directions

C. The whole surface of each layer of pavement should be checked for levels by the conformance survey, and for flatness with a 10 foot straightedge in all directions; the surface shall also be flooded and inspected for ponding, ‘‘bird baths”, ridges, etc.

D. After testing, all high and low areas shall be marked on the leveling course surface.

E. Low areas shall be remedied by cutting out the course to full depth (or to a minimum depth of ¾” - 1” (20 – 25 mm)) and replacing with the correct hot mixture. The repaired area shall be thoroughly compacted to the specified tolerance. First the area must be fully tack coated. No filling by using sand mix shall be allowed. Sand asphalt lacks sufficient internal strength. No tar emulsions such as ‘jet shield’’ or similar products shall be applied to the surface. Nor shall any other type at asphalt or tar leveling or sealing product (hot or cold) be coated on the surface, Under specific conditions and with Track Surfacing’s prior approval, a polyurethane underlayment material as recommended by the manufacturer can be used for correcting small low areas. Extensive use of Polyurethane underlayment is no substitute for proper installation and leveling of the asphalt. The depth of the underlayment layer must be limited to ¼” (6 mm) or less. High areas shall be remedied by cutting out the course to full depth (or to a minimum depth of ¾” - 1” (20 – 25 mm)) and replacing with the correct hot mixture. The repaired area shall be thoroughly compacted to the specified tolerance. In some cases it is practical to repair high areas and ridges by heating with

a ‘‘hot iron’’ or a butane torch and scraping them off. These areas must be rolled smooth afterwards.

3.6 CURING

A. The asphalt leveling course will have to cure a minimum of thirty (30) days prior to installation of the Track surface in order to allow the escape of surface volatiles, oils. etc. and to maximize resin adhesion of the Track surfacing to the asphalt pavement.

3.7 PROTECTION

A. Do not allow vehicular traffic on newly paved areas until surface has cooled to atmospheric temperature and not less than 24 hours after completing asphaltic concrete work.

END OF SECTION

SECTION 321300 - RIGID PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnishing, placing, spreading, compacting and shaping portland cement concrete pavement with undoweled transverse weakened plane joints.

B. Form construction and use in placing portland cement concrete pavement.

C. Joints for portland cement concrete pavement.

D. Finishing portland cement concrete pavement.

E. Curing and protecting portland cement concrete pavement.

1.02 RELATED DOCUMENTS

A. AASHTO Standard Specifications

1. T 53: Standard Method of Test for Softening Point of Bitumen (Ring-and-Ball Apparatus).

B. ASTM Standards

1. A 615: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

2. A 775: Standard Specification for Epoxy-Coated Steel Reinforcing Bars.

3. A 934: Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars.

4. C 881: Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

5. D 2628: Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.

6. D 2835: Standard Specification for Lubricant for Installation of Preformed Compression Seals in Concrete Pavements.

7. D 6690: Standard Specification for Joint and Crack Sealants, Hot-Applied , for Concrete and Asphalt Pavements.

8. D 3963: Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars.

C. Caltrans Standard Specifications:

1. Section 40, Concrete Pavement.

2. Section 52, Reinforcement.
3. Section 90, Concrete.
4. Section 95, Epoxy.

D. Caltrans Standard Plans:

1. Plan A35A: Portland Cement Concrete Pavement (Undoweled Transverse Joints).
2. Plan A35C: Portland Cement Concrete Pavement Joint and End Anchor Details.

1.03 DEFINITIONS

A. AASHTO: American Association of State Highway and Transportation Officials.

B. ASTM: American Society for Testing and Materials.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Manufacturer must be certified according to the National Ready Mix Concrete Plant Certification Program.

B. Installer Qualification: An experienced installer who has completed pavement work similar in material, design and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.

1.05 SUBMITTALS

A. Follow submittal procedures outlined in Division 01 Specifications.

B. Design Mixes: For each concrete pavement mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results or other circumstances warrant adjustments.

C. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements.

1. Cementitious materials and aggregates.
2. Steel reinforcement and reinforcement accessories.
3. Admixtures.
4. Curing compound.
5. Applied finish material.

6. Bonding agent of adhesive.
7. Joint filler.
8. Joint Sealant.
9. Tie Bars.
10. Epoxy.
11. Backer Rods.

PART 2 PRODUCTS

2.01 PORTLAND CEMENT CONCRETE

A. General: Conform to Caltrans Standard Specifications, Section 90. Use Class 2 Concrete.

2.02 TIE BARS

A. Deformed reinforcing steel bars conforming to the requirements of ASTM Designation A 615/A (615M), Grade 40 or 60 (Grade 300 or 420).

B. Epoxy-coat in conformance with the provisions in Section 52-2.02 of Caltrans Standard Specifications, except that references made to ASTM Designation D 3963/D 3963M shall be deemed to mean ASTM Designation A 934/A 934M or A 775/775M.

C. Do not bend tie bars.

2.03 EPOXY

A. Bond tie bars to existing concrete with epoxy resin conforming to Section 95-1.02D, "Epoxy Resin Adhesive for Bonding Freshly Mixed Concrete to Hardened Concrete," of the Caltrans Standard Specifications.

2.04 SILICONE JOINT SEALANT

A. Furnish low modulus silicone joint sealant in a one-part silicone formulation. Do not use acid cure sealants. Compound to be compatible with the surface to which it is applied and conform to the following requirements:

Specification	Test Method	Requirement
Tensile stress, 150% elongation, 7-day cure at 25°± 1°C and 45% to 55% R.H.[e]	ASTM D 412 (Die C)	310 kPa max.
Flow at 25° ± 1°C	ASTM C 639[a]	Shall not flow from channel

Extrusion Rate at 25° ± 1°C	ASTM C 603[b]	75-250 g/min.
Specific Gravity	ASTM D 792 Method A	1.01 to 1.51
Durometer Hardness, at -18°C, Shore A, cured 7 days at 25° ± 1°C	ASTM C 661	10 to 25
Ozone and Ultraviolet Resistance, after 5000 hours	ASTM C 793	No chalking, cracking or bond loss
Tack free at 25° ± 1°C and 45% to 55% R.H.[e]	ASTM C 679	Less than 75 minutes
Elongation, 7 day cure at 25° ± 1°C and 45% to 55% R.H.[e]	ASTM D 412 (Die C)	500 percent min.
Set to Touch, at 25° ± 1°C and 45% to 55% R.H.[e]	ASTM D 1640	Less than 75 minutes
Shelf Life, from date of shipment	—	6 months min.
Bond, to concrete mortar-concrete briquets, air cured 7 days at 25° ± 1°C	AASHTO T 132[c]	345 kPa min.
Movement Capability and Adhesion, 100% extension at -18°C after, air cured 7 days at 25° ± 1°C, and followed by 7 days in water at 25° ± 1°C	ASTM C 719[d]	No adhesive or cohesive failure after 5 cycles

Notes:

ASTM Designation: C 639 Modified (15 percent slope channel A).
ASTM Designation: C 603, through 3-mm opening at 345 kPa.
Mold briquets in conformance with the requirements in AASHTO Designation: T 132, sawed in half and bonded with a 1.5 mm maximum thickness of sealant and tested in conformance with the requirements in AASHTO Designation: T 132. Briquets shall be dried to constant mass at 100 ± 5° C.
Movement Capability and Adhesion: Prepare 305 mm x 25 mm x 75 mm concrete blocks in conformance with the requirements in ASTM Designation: C 719. A sawed face shall be used for bond surface. Seal 50 mm of block leaving 12.5 mm on each end of specimen unsealed. The depth of sealant shall be 9.5 mm and the width 12.5 mm.
R.H. equals relative humidity.

B. Formulate the silicon joint sealant to cure rapidly enough to prevent flow after application on grades of up to 15 percent.

C. Furnish to the Owner a Certificate of Compliance. Accompany certificate with a certified test report of the results of the required tests performed on the sealant material within the previous 12 months prior to proposed use. Provide the certificate and accompanying test report for each lot of silicone joint sealant prior to use on the project.

2.05 ASPHALT RUBBER JOINT SEALANT

A. Conform to the requirements of ASTM Designation: D 6690 as modified herein or to the following:

1. Provide a mixture of paving asphalt and ground rubber. Ground rubber to be vulcanized or a combination of vulcanized and de-vulcanized materials ground so that 100 percent will pass a 2.36-mm sieve and contain not less than 22 percent ground rubber, by mass. Modifiers may be used to facilitate blending.

2. The Ring and Ball softening point shall be 57°C minimum, when tested in conformance with the requirements in AASHTO Designation: T 53.

3. Provide asphalt rubber sealant material capable of being melted and applied to cracks and joints at temperatures below 204°C.

B. The penetration requirement of Section 4.2 of ASTM Designation: D 6690 do not apply. The required penetration at 25°C, 150g, 5s, shall not exceed 120.

C. The resilience requirement of Section 4.5 of ASTM Designation: D 6690 do not apply. The required resilience, when tested at 25°C, shall have a minimum of 50 percent recovery.

D. Accompany each lot of asphalt rubber joint sealant shipped to the job site, whether as specified herein or conforming to the requirements of ASTM Designation D 6690, as modified herein, by a Certificate of Compliance, storage and heating instructions and precautionary instructions for use.

E. Heat and place in conformance with the manufacturer's written instructions and the details shown on the plans. Provide manufacturer's instructions to the Owner. Do not place when the pavement surface temperature is below 10°C.

2.06 PREFORMED COMPRESSION JOINT SEALANT

A. Material: ASTM Designation: D 2628.

1. Number of cells: 5 or 6.

2. Lubricant Adhesive: ASTM Designation D 2835.

3. Install compression seals along with lubricant adhesive according to the manufacturer's recommendations. Submit manufacture's recommendations to the Owner’s Representative`.

B. Accompany each lot of compression seal and lubricant adhesive by a Certificate of Compliance, storage instructions and precautionary instructions for use. Also submit the manufacturer's data sheet with installation instructions and recommended model or type of preformed compression seal for the joint size and depth as shown on the plans. Show evidence that the selected seal is being compressed at level between 20 and 50 percent at all times for the joint width and depth shown on the plans.

2.07 BACKER RODS

A. Provide backer rods that have a diameter prior to placement at least 25 percent greater than the width of the saw cut after sawing and are expanded, crosslinked, closed-cell polyethylene foam that is compatible with the joint sealant so that no bond, adverse reaction occurs between the rod and sealant. In no case use a hot pour sealant that will

melt the backer rod. Submit a manufacturer's data sheet verifying that the backer rod is compatible with the sealant to be used.

PART 3 EXECUTION

3.01 WATER SUPPLY

A. Conform to Section 40-1.02 of Caltrans Standard Specifications.

3.02 SUBGRADE

A. Conform to Section 40-1.04 of Caltrans Standard Specifications.

3.03 SOIL STERILANT

A. Furnish and apply to areas indicated in accordance with Section 31 31 19 – Vegetation Control.

3.04 PLACING

A. Conform to Section 40-1.03F of Caltrans Standard Specifications.

3.05 SPREADING COMPACTING AND SHAPING

A. Conform to Section 40-1.07 of Caltrans Standard Specifications.

1. Stationary Side Form Construction: Section 40-1.03F(4) of Caltrans Standard Specifications.

2. Slip Form Construction: Section 40-1.03F(5) of Caltrans Standard Specifications.

3.06 INSTALLING TIE BARS

A. Install at longitudinal contact joints, longitudinal weakened plane joints, and transverse contact joints as shown on the plans. In no case, shall any consecutive width of new portland cement concrete pavement tied together with tie bars exceed 15 meters. In no case shall tie bars be used at a joint where portland cement concrete and asphalt concrete pavements abut.

B. Tie bars shall be installed at longitudinal joints by one of the 3 following methods:

1. Drilling and bonding in conformance with the details shown on the plans. Provide a two-component, epoxy-resin, conforming to the requirements of ASTM Designation: C 881, Type V. Grade 3 (Non-Sagging), Class shall be as follows:

Temperature of Concrete	Required Class of Epoxy Resin
Lower than 40° F (4.5 °C)	A
40˚ F (4.5˚ C) through 60˚ F (15.5˚ C)	B

Above 60˚ F (15.5˚ C) C

2. Provide, at least 7 days prior to start of work, a Certificate of compliance and a copy of the manufacturer's recommended installation procedure. The drilled holes shall be cleaned in accordance with the epoxy manufacturer's instructions and shall be dry at the time of placing the epoxy and tie bars. Immediately after inserting the tie bars into the epoxy, the tie bars shall be supported as necessary to prevent movement during the curing and shall remain undisturbed until the epoxy has cured a minimum time as specified by the manufacturer. Tie bars that are improperly bonded, as determined by the Owner, will be rejected. If rejected, adjacent new holes shall be drilled, as directed by the Owner, and new tie bars shall be placed and securely bonded to the concrete. All work necessary to correct improperly bonded tie bars shall be performed at the Contractor's expense.

3. Insert the tie bars into the plastic slip-formed concrete before finishing the concrete. Inserted tie bars shall have full contact between the bar and the concrete. When tie bars are inserted through the pavement surface, the concrete over the tie bars shall be reworked and refinished to such an extent that there is no evidence on the surface of the completed pavement that there has been any insertion performed. Any loose tie bars shall be replaced by drilling and grouting into place with epoxy as described in method 1 above at the Contractor's expense.

4. By using threaded dowel splice couplers fabricated from deformed bar reinforcement material, free of external welding or machining. Threaded dowel splice couplers shall be accompanied by a Certificate of Compliance and installation instructions. Installation of threaded dowel splice couplers shall conform to the requirements of the manufacturer's recommendations.

3.07 JOINTS

A. Conform to Section 40-1.03B of Caltrans Standard Specifications, except that tie bars shall be as specified under Part 2, Products.

1. Transverse Contact Joints: Section 40-1.08A of Caltrans Standard Specifications.

(a) Construct a transverse contact (construction) joint at the end of each day's work, or where concrete placement is interrupted for more than 30 minutes, to coincide with the next weakened plane joint location.

(b) If sufficient concrete has not been mixed to form a slab to match the next weakened plane joint, when an interruption occurs, the excess concrete shall be removed and disposed of back to the last preceding joint. The cost of removing and disposing of any excess concrete shall be at the Contractor's expense. Any excess material shall become the property of the Contractor and shall be properly disposed of.

(c) A metal or wooden bulkhead (header) shall be used to form the joint. The bulkhead shall be designed to accommodate the installation of tie bars.

2. Weakened Plane Joints: Section 40-1.08B, except that the insert method of forming joints in pavement shall not be used.

3.08 FINISHING

A. Conform to Sections 40-1.03H(2) and 40-1.103H(3) of Caltrans Standard Specifications.

3.09 CURING

A. Conform to Section 40-1.03I of Caltrans Standard Specifications.

3.10 SEALING JOINTS

A. Liquid Joint Sealant Installation.

1. The joint sealant detail for transverse and longitudinal joints, as shown on the plans, shall apply only to weakened plane joints. Construct weakened plane joints by the sawing method. Should grinding or grooving be required over or adjacent to any joint after sealant has been placed, completely remove the joint material and disposed of, and replace at the Contractor's expense. Recess sealant below the final finished surface as shown on the plans.

2. At the Contractor's option, transverse weakened plane joints shall be either Type DSC or Type SSC as shown on the plans. Longitudinal weakened plane joints shall be Type SSC only as shown on the plans.

3. Seven days after the concrete pavement placement and not more than 4 hours before placing backer rods and joint sealant materials, clean the joint walls by the dry sand blast method and other means as necessary to completely remove from the joint all objectionable material such as soil, asphalt, curing compound, paint and rust. After cleaning the joint, remove all traces of sand, dust and loose material from and near the joint for a distance along the pavement surfaces of at least 50 mm on each side of the joint by the use of a vacuum device. Remove surface moisture at the joints by means of compressed air or moderate hot compressed air or other means approved means. Do not use drying procedures that leave a residue or film on the joint wall. Sandblasting equipment shall have a maximum nozzle diameter size of 6 ± 1 mm and a minimum pressure of 0.62-MPa.

4. Install backer rod as shown on the plans. Provide an expanded, closed-cell polyethylene foam backer rod that is compatible with the joint sealant so that no bond or adverse reaction occurs between the rod and sealant. Install backer rod when the temperature of the portland cement concrete pavement is above the dew point of the air and when the air temperature is 4°C or above. Install backer rod when the joints to be sealed have been properly patched, cleaned and dried. Do not use a method of placing backer rod that leave a residue or film on the joint walls.

5. Immediately after placement of the backer rod, place the joint sealant in the clean, dry, prepared joints as shown on the plans. Apply the joint sealant by a mechanical device with a nozzle shaped to fit inside the joint to introduce the sealant from inside the joint. Apply adequate pressure to the sealant to ensure that the sealant material is extruded evenly and that full continuous contact is made with the joint walls. After application of the sealant recess the surface of the sealant as shown on the plans.

6. Any failure of the joint material in either adhesion or cohesion of the material will be cause for rejection of the joint. Conform the finished surface of joint sealant to the dimensions and allowable tolerances shown on the plans. Rejected joint materials or joint material whose finished surface does not conform to the dimensions shown on the plans shall be repaired or replaced, at the Contractor's expense, with joint material that conforms to the requirements.

7. After each joint is sealed, remove all surplus joint sealer on the pavement surface. Traffic shall not be permitted over the sealed joints until the sealant is tack free and set sufficiently to prevent embedment of roadway debris into the sealant.

B. Preformed Compression Joint Seal Installation

1. The compression seal alternative joint detail for transverse and longitudinal joints, as shown on the plans, shall apply only to weakened plane joints. Construct weakened plane joints by the sawing method. Should grinding or grooving be required over or adjacent to any joint after the compression seal has been placed, completely remove the joint materials and disposed of, and replace at the Contractor's expense. Compression seal shall be recessed below the final finished surface as shown on the plans.

2. At the Contractor's option, transverse weakened plane joints shall be either Type DSC or Type SSC as shown on the plans. Longitudinal weakened plane joints shall be Type SSC only as shown on the plans.

3. Seven days after the concrete pavement placement and not more than 4 hours before placing preformed compression joint seals, clean the joint walls by the dry sand blast method and other means as necessary to completely remove from the joint all objectionable material such as soil, asphalt, curing compound, paint and rust. After cleaning the joint, remove all traces of sand, dust and loose material from and near the joint for a distance along the pavement surfaces of at least 50 mm on each side of the joint by the use of a vacuum device. Remove surface moisture at the joints by means of compressed air or moderate hot compressed air or other means. Do not use drying procedures that leave a residue or film on the joint wall. Sandblasting equipment shall have a maximum nozzle diameter size of 6 ± 1 mm and a minimum pressure of 0.62-MPa.

3.11 PROTECTING CONCRETE PAVEMENT

A. Conform to Section 40-1.12 of Caltrans Standard Specifications.

END OF SECTION

SECTION 321813 – SYNTHETIC TURF SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION

A. This document provides the specifications for a Synthetic Grass Safety System composed of Non-expansive engineered silicone dioxide bead infill placed into a tufted polyethylene fiber component installed over a cushion layer with a sub base specified on the plans and Specification Section 321123, Permeable Base For Synthetic Turf System.

B. There are variations in the final specifications as required by the Client.

1.02 WORK INCLUDED

A. Provide all labor, materials, equipment, and tools necessary for the complete installation of an attenuated synthetic grass infill system as outlined in these specifications. The system should consist of but not necessarily be limited to the following:
   1. A vertical draining field base consisting of a layer of compacted aggregate base specified on the plans and Specification Section 321123.
   2. A complete synthetic grass system, consisting of:
      a. Synthetic turf
      b. Cushion layer
      c. An infill system, consisting of a specially formulated non-expansive, coated, clean, dust free and specially sized silicon dioxide bead (Envirofill brand preferred).

B. This shall be installed per plan details.

C. Quality Assurance: Manufacturer should have manufactured and installed synthetic grass surfaces for a minimum of 5 years.

1.03 SUBMITTALS

A. Prospective manufacturers and/or installers of the turf should be required to comply with the following:
   1. The turf manufacturer must be experienced in the manufacture of a nailer board method synthetic grass system and provide references of five (5) specific installations in the last three (3) years.
   2. The turf installer must provide competent workmen skilled in synthetic grass installation. The designated supervisory personnel on the project must be competent in the installation of this material, including gluing seams and proper installation of the infill mixture.
   3. Installation should be in accordance with ASTM F1292 for Impact Attenuation of surface system under and around playground equipment. The poured in place system to be installed in compliance with the Critical Fall Height as determined by the equipment manufacturer.
   4. IPEMA Certification specific to poured in place rubber and synthetic

grass safety systems.

5. Manufacturer should provide written instructions for recommended maintenance practices.
6. Manufacturer should submit samples for customer verification. Samples shall include two 6”x6” samples of 1” cushion layer topped with synthetic turf.

1.04 DEFINITIONS

A. Critical Fall Height: A critical fall height (CFH) is the maximum height of fall from play equipment to the ground. It is important to note that safety surfaces do not prevent injury but aim to lessen the severity of any injury that may occur on falls from height.

B. Fall Height: Fall height is a measurement defined as the “vertical distance between a designated play surface and the protective surfacing beneath it.

C. SBR: Styrene-butadiene or styrene-butadiene rubber (SBR) describe families of synthetic rubbers derived from styrene and butadiene

1.05 ASTM TESTING STANDARDS – FLEXGROUND STANDARD MEETS OR EXCEEDS ALL REQUIRED ASTM STANDARDS BELOW

A. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.

B. ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials

C. ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester

D. ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment

E. ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment

F. ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method – This standard replaces ASTM D2047

G. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension

1.06 WARRANTY AND MAINTENANCE

A. The bidder and/or the turf manufacturer must provide the following:
   1. The turf manufacturer should provide a warranty to the owner that covers defects in materials and workmanship of the turf for a period of FIVE (5)

years from the date of Substantial Completion, and TWO (2) years on seams.

2. The manufacturer's warranty should specifically exclude vandalism, acts of War and acts of Nature beyond the control of the owner of the manufacturer.
3. All turf warranties should be limited to repair or replacement of the affected areas and should include all necessary materials, labor, transportation costs, etc. to complete said repairs.
4. All warranties are contingent upon full payment by the owner of all pertinent invoices and owner, at owner's expense, completing a full power-brooming and "top-off" of lost infill at two-year intervals from date of substantial completion.
5. The bidder should provide a maintenance program to the owner. The warranty should be subject to compliance with said maintenance program in addition to items named above.

PART 2 SYNTHETIC TURF MATERIAL

2.01 THE SYNTHETIC TURF MATERIAL AND RESILIENT CUSHION SHOULD BE IN ACCORDANCE WITH THE FOLLOWING:

A. A synthetic grass wearing layer upper membrane and an underlying attenuation cushion layer (SBR cushion layer). The finished surface should be porous and capable of being installed at varying thickness to comply with Critical Fall Height requirements of equipment.

B. The SBR cushion layer should be a mixture of black recycled rubber mixed with a 100% solids moisture cured aromatic Polyurethane binder (100 pounds of rubberized cushion layer to 12 pounds of binder) installed at the appropriate thickness. The cushion layer should be porous.

C. Synthetic Turf shall be Flexgrass KidPlay:
1. A (one and one-half) 1.5" long proprietary polyethylene yarn formulation for superior wear resistance and a secondary proprietary polyethylene thatch yarn formulation.
2. The system should be tufted with a minimum of 60 ounces of yarn per square yard. The system should also include a woven polypropylene primary backing and a secondary polyurethane backing.
3. The machine gauge shall be 1/2".
4. Total fabric weight shall be at least 88 ounces per square yard.
5. The finished product should also include perforations to ensure drainage greater than 30 inches per hour. Non-perforated systems should not be acceptable alternates for purposes of this specification.

D. The turf should be delivered in 15' wide rolls.

E. All lines, numbers and markings indicated on plans should be permanently inlaid. Painted lines should not be an acceptable alternative for purposes of this specification.

F. The fiber should be green in color to simulate natural grass as closely as possible and treated with UV inhibitor, guaranteed a minimum of eight years.

G. The infill system should be a non-expansive engineered coated, clean, dust free and specially sized silicon dioxide beads. Infill shall be installed at 2-4lbs per square foot.

H. Latex backed turf shall not be acceptable. All adhesives must also be latex free.

I. Standard of Quality should be FlexGrass KidPlay Turf system as built by FlexGround, LLC Contact: FlexGround | Bill Stafford | 602.954.0000

PART 3 SITE PREPARATION AND BASE

3.01 THE SITE PREPARATION AND BASE SHOULD BE IN ACCORDANCE WITH THE FOLLOWING:

A. The sub-base will have a slope as indicated on the drawings.

B. The base aggregate shall be as designated on the plans and Specification Section 321123, Permeable Base For Synthetic Turf System.

C. The sub base should be installed in two inch (2”) lifts to appropriate thickness.

D. The sub-base should be compacted using vibrating tamper, to approximately 90% Proctor density.

E. The sub-base should no longer have any vegetation.

F. Subgrade prior to aggregate installation: Sublevel grade is to be compacted prior to the ABC aggregate installation. Particular attention should be paid to areas of disturbed earth such as where footers for equipment enter the ground. Concrete used to fill said areas/footers should be poured to the top of sublevel surface.

G. The sub-base installer and architect will accept the aggregate base in writing prior to the installation of the poured in place system.

H. Any alterations must be agreed between all parties.

I. Drainage considerations should be made by Client, Owner, Architect or Civil Engineer. It is often recommended for sites utilizing aggregate base rock, and always required for curb-to-curb Concrete.

PART 4 EXECUTION AND INSTALLATION

4.01 The safety surfacing installer should strictly adhere to the installation procedures outlined under these sections. Any variance from these requirements should be accepted in writing by the manufacturer’s onsite representative and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

A. Primer
   1. A urethane primer should be applied to concrete, asphalt or wood surfaces at a rate of 200-250 square feet per gallon. The entire area does not need to be primed at once, instead, prime about 700 square feet at a time in immediate advance of rubber installation. This procedure should be continued until all areas are complete.
   2. The urethane primer should be applied to any playground equipment that will be surrounded by the poured in place safety surfacing system.

B. Cushion Layer – SBR Poured in Place
   1. The components of the poured in place safety surfacing should be mixed on site in a mixer to ensure a comprehensive mix according to manufacturer's instructions.
   2. The cushion layer comprised of a mixture of black recycled rubber mixed with aromatic moisture cured polyurethane binder, at an appropriate rate, and mixed thoroughly so that the binder is evenly dispersed into the rubber base.
   3. The cushion layer mix should then be spread and troweled to the desired depth and allow to cure for 24 hours.

C. Synthetic Turf Layer
   1. The synthetic grass should be cut and laid out across the area, and utilizing standard state-of-the-art gluing and nailing procedures, each roll should be seamed to the next.
   2. The edge of the synthetic turf should be glued directly with full contact to the glue down strip around the perimeter and any protrusions of the turf area, and adhered to the nailer board per plan details.
   3. Staples shall be used to connect turf to nailer board at perimeter only. Staples to be 18—gauge crown staples; 1.5" and galvanized; or equal. Install staples 2" on center.
   3. A strip of seam tape and urethane should be used to seam the rolls of material.

D. Infill
   1. The infill material shall be spread evenly, at an approximate rate of 2-4 lbs per square foot with a large fertilizer type spreader. The infill will be spread in strict accordance with the turf installer's specifications.
   2. Between each application of infill, the field area should be brushed with a motorized rotary nylon broom.
   3. Caution: Too much fiber exposed (not enough infill) will cause the fibers to mat or crush with heavy foot traffic. This will lead to premature wearing of the fiber and will void any manufacturer's warranty. No Crumb Rubber shall be used as infill.

PART 5 SITE (GENERAL)

5.01 Trailer / Large truck access will be necessary for the installation. In the case that access for trailer/truck is not available the owner or general contractor will be responsible for transporting material to the job site.

5.02. Crew is responsible for protecting the surface only while on site. General Contractor or owner shall be responsible for the security of the surfacing overnight during installation, as well as during the surfacing's curing period upon completion of the install.

5.03. Crew will leave site clean and shall remove all trash and debris.

5.04 Owner/General contractor shall provide a dumpster for all waste and trash.

END OF SECTION

SECTION 321823.10 - SYNTHETIC TRACK SURFACING – MATERIALS (CMAS)

PART 1 GENERAL

1.1 SCOPE OF WORK:

The Owner has purchased synthetic track surfacing materials for the Beynon BSS 300 embedded sandwich track system. The track system materials are Owner Furnish (OF) and not part of the project bid. Installation (by Beynon) is part of the bid. This section is for clarification and in coordination with the general contractor's scope of work and project schedules.

A. It shall be the responsibility of the synthetic track surfacing manufacturer and installer to provide all labor, materials, equipment, and tools necessary for the complete installation of the synthetic track surfacing system as indicated on the plans and as specified herein.

B. The materials for the specified BSS 300 track system are separate of the project bid and have been purchased direct through CMAS.

C. Installation of all materials shall be performed in strict accordance with the manufacturer's installation instructions, by certified Beynon installation crews, and in accordance with project specifications, plans, and all approved shop drawings.

D. Perimeter edge details required for the system shall be as detailed and recommended by the Manufacturer, and as approved by the Owner. Supply and installation of these details will be under the scope of work of the general contractor based on project plans and are not part of the synthetic track surfacing manufacturer / installer's scope.

E. The system shall consist of, but not necessarily be limited to, the following:

1. An acceptable subbase including asphalt paving, base rock, concrete curbs and a drainage system to drain the impermeable track surfacing system constructed by the General Contractor per the contract drawings.

2. Beynon BSS 300 Track Surfacing System.

PART 2 GENERAL CONTRACTOR QUALIFICATIONS FOR INSTALLING THE DRAINAGE BASE

A. Installers of the subsurface base system and AC paving for the track shall be required to comply with and supply proof/references to the Owner with bid:

1. General Contractor installing the base system must have a Class A California Engineering Contractor's License.

2. General Contractor and / or AC paving contractor must have prior direct experience in paving a base for synthetic running track to required tolerances

and must have paved a minimum of 5 tracks in California during the past 3 years, with a minimum size of 60,000 SF per track and field event areas.

PART 3 SYNTHETIC TRACK SURFACING MATERIAL/INSTALLATION

3.1 Beynon BSS 300 Track Surfacing System
Beynon materials have been purchased by the Owner direct via separate CMAS contract.

*Installation of the BSS 300 track surfacing system is part of the civil construction bid scope of work.

Contact for Beynon Sports is:

- Mason Farnsworth; (559) 283-3071; MFarnsworth@beynonsports.com

A. Installation of track surfacing including mobilization, prep work, and track surfacing installation, and clean up, will require **15 – 17 working days.**

B. Track striping will require **4 additional working days** by a separate crew.

PART 4 CLEANING RECOMMENDATIONS

A. The general contractor shall protect installed track asphalt base from subsequent construction operations during the 28 curing time.

B. Do not permit traffic over unprotected asphalt prior to track surfacing.

C. General Contractor shall provide the labor, supplies, and equipment as necessary for final cleaning of asphalt base and installed items prior to track surfacing installation.

PART 5 PROJECT CLOSEOUT

A. Beynon will train the Owner's facility maintenance staff in the maintenance and care of the new track surfacing.

END OF SECTION

SECTION 321823.20 - SYNTHETIC TRACK SURFACING – INSTALLATION ONLY

PART 1 GENERAL

1.1 SCOPE

A. The installing synthetic surfacing contractor shall furnish all labor, equipment, supervision, and services necessary for the proper installation and completion of the **BSS 300** Synthetic Track Surfacing System and related work indicated on the drawings and specified herein.

B. Materials for the BSS 300 synthetic track surfacing system have been purchased direct via CMAS and are not part of the project bid.

C. Beynon Contact:

a. Mason Farnsworth
b. 4668 N. Sonora Ave. Suite 101, Fresno, CA 93722
c. Phone: 559-283-3071
d. Email: mfarnsworth@beynonsports.com

D. Installing contractor shall meet Section 3.1 Quality Assurance requirements.

E. The synthetic surfacing contractor shall refer to the drawings for the required locations of synthetic track surfacing to be installed. All quantities and dimensions shall be field verified by the synthetic surfacing contractor.

1.2 SPECIFIC SCOPE OF WORK

A. Install a WORLD ATHLETICS (WA) approved, impermeable polyurethane synthetic track system consisting of SBR Rubber and BEYPUR, a single-component polyurethane binder and BEYPUR, a poured-in-place, two-component U.V. stabilized elastomeric polyurethane with an embedded textured wearing layer.

B. Layout and paint all track lines and event markings as required and specified by owner and the applicable governing body for the specified project; either WORLD ATHLETICS (WA), NCAA, NFSHSA rules and or Owner requirements.

1.3 COORDINATION

A. The synthetic surfacing contractor shall coordinate the work specified with an authorized and appointed representative of the owner to perform the work during a period and in a manner acceptable to the owner.

PART 2 CODES AND STANDARDS

2.1 Applicable Publications

A. Codes and standards follow the current guidelines set forth by the WORLD ATHLETICS (WA), the National Collegiate Athletic Association (NCAA) and the National Federation of State High School Associations (NFSHSA), along with the current material testing guidelines as published by the American Society of Testing and Materials (ASTM).

2.2 PERFORMANCE STANDARDS

The BSS 300 synthetic track surfacing system shall exhibit the following minimum performance standards as required by WORLD ATHLETICS (WA):

A.	Thickness:	(12-13mm) or as specified
B.	Force Reduction	35-50%
C.	Vertical Deformation:	0.6mm-2.5mm
D.	Coefficient of Friction:	≥ 0.5 (47 TRRL Scale)
E.	Tensile Strength:	≥ 0.5 Mpa
F.	Elongation:	≥ 40%

PART 3 QUALITY ASSURANCE

3.1 CONTRACTOR AND MANUFACTURER QUALIFICATIONS

A. The CONTRACTOR and the MANUFACTURER must be the same.

B. The CONTRACTOR and MANUFACTURER must have a minimum of 5 years of experience in the installation of poured-in-place, two-component elastomeric polyurethane synthetic track surfacing in the California market.

C. The CONTRACTOR shall be able to furnish evidence that they have been in business for a period of not less than 3 years, under the present name, and if required, furnish financial statements for each of the past 3 years.

D. The CONTRACTOR must have a current California contractor’s license and DIR number at time of bid.

E. The CONTRACTOR must have installed a minimum of 10 outdoor track facilities in California in the last 3 years using the exact, WORLD ATHLETICS (WA) certified BSS 300 synthetic track surfacing, as specified herein with the contractor bidding this project. CA install reference form is to be included with bid.

F. The MANUFACTURER must have a minimum of 10 years of experience with compound two-part polyurethane for athletic surfaces.

G. The CONTRACTOR is required to provide documentation that shows the selected specified and installed product meets current WORLD ATHLETICS (WA) Performance Standards for Synthetic Surfaced Athletics Tracks (Outdoor) and is certified in terms of the WORLD ATHLETICS (WA) certification system as updated to present day.

H. The MANUFACTURER must offer a minimum of seven (7) WORLD ATHLETICS (WA) Certified Track Systems.

I. All polyurethane components must be MANUFACTURED in the United States in an **ISO 9001:2015 Certified** facility to ensure the highest quality materials.

J. The CONTRACTOR/MANUFACTURER must supply a ten (10) year third party insured warranty covering this project.

3.2 SUBMITTALS

The following submittals must be received prior to installation and be reviewed and approved by the owner:

A. Standard printed specifications of the synthetic track surfacing system to be installed on this project.

B. An affidavit attesting that the synthetic track surfacing material to be installed meets the requirements defined by the manufacturers currently published specifications and any modifications outlined in those technical specifications.

C. A synthetic track surfacing system sample, 4” x 6” (min.) in size, of the same synthetic track surfacing system to be installed on this project.

D. A list of completed facilities, including the installing supervisor, of the exact synthetic track surfacing system.

E. A current WORLD ATHLETICS (WA) Certificate proving the product to be installed meets the current WORLD ATHLETICS (WA) Performance Standards for Synthetic Surfaced Athletics Tracks (Outdoor).

PART 4 MATERIALS – FOR REFERENCE ONLY (OWNER FURNISHED VIA CMAS)

4.1 ELASTOMERIC POLYURETHANE

A. BEYPUR, the two-component U.V. stabilized elastomeric polyurethane compounded from polyol and isocyanate components, based on one hundred percent (100%) Methylene Diphenyl Isocyanate (MDI). No Toluene Diisocyanate Isocyanate (TDI) will be allowed.

4.2 EPDM GRANULATE

A. The EPDM granulates shall be approximately 1 to 3mm in size.

B. The EPDM granulates and the U.V. stabilized elastomeric polyurethane shall be color matched.

4.3 RUBBER GRANULATE OF THE BASE COURSE

A. Styrene Butadiene Rubber (SBR) processed ground to a graded size of 1-3mm.

B. A maximum of 82%, by weight of the paved-in-place base layer, of SBR will be allowed.

4.4 SINGLE COMPONENT POLYURETHANE BINDER

A. This binder shall be BEYPUR 300, a single-component polyurethane binder with a long cure time for use in paved mat specifications; a minimum of 18%, by weight of the paved-in-place base layer.

4.5 SEAL COAT

A. This seal coat shall be BEYPUR 200, a two-component polyurethane pore sealer use with paved rubber granule mats. The granular SBR and binder layer shall be sealed with the BEYPUR 200. The application of EPDM dust is not allowed.

4.6 LINE MARKING PAINT

A. All line and event markings shall be applied by experienced personnel utilizing the manufacturer's recommended pigmented paint compatible with the BSS 300 Track Surfacing material.

PART 5 INSTALLATION

5.1 SUBBASE REQUIREMENTS

A. Asphalt Compaction

a. The Synthetic Track Surfacing System shall be laid on an approved subbase. The General Contractor shall provide compaction test results of 92-96% for the installed subbase and asphalt surface.

b. For NCAA certification the following criteria must be followed. The track surface, i.e., asphalt substrate, shall not vary from planned cross slope by more than +/- 0.2%, with a maximum lateral slope outside to inside of 1%, and a maximum slope of 0.1% in any running direction. The finished asphalt shall not vary under a 10' straight edge more than 1/8".

c. It should be the responsibility of the asphalt-paving contractor to flood the surface immediately after the asphalt is capable of handling traffic. If, after 20 minutes of drying time, there are birdbaths evident, it shall be the responsibility of the architect, in conjunction with the surfacing contractor, to determine the method of correction. No cold tar patching, skin patching or sand mix patching will be acceptable.

B. Asphalt Quality

a. No Recycled Asphalt Pavement (RAP) shall be used in the wear course asphalt mix design as the inclusion of RAP as an off-set to virgin asphalt binder results in a brittle hot-mix asphalt (HMA) with significantly lower tensile strength and fatigue resistance. The sports surfacing contractor will not be held responsible for asphalt failures resulting from the inclusion RAP in the HMA mix design of the wear course.

b. Any oil spills (hydraulic, diesel, motor oil, etc.) must be completely removed, either by chipping out or removing and replacing with new, keyed in asphalt. The minimum depth of any asphalt replacement shall be one inch. The curing time for the asphalt base is 28 days. It shall be the responsibility of the surfacing contractor to determine if the asphalt substrate has cured sufficiently prior to the application of polyurethane surfacing system.

C. Responsibility of Others

a. It shall be the responsibility of the general contractor to determine if the asphalt substrate meets all design specifications, i.e., cross slopes, planarity, and specific project criteria. After all the above conditions are met, the synthetic surfacing contractor must, in writing, accept the planarity of the asphalt receiving base before work can commence.

5.2 THICKNESS

A. The thickness of the **BSS 300** Synthetic Track Surfacing System shall be 13mm.

5.3 EQUIPMENT

A. The **BSS 300** Synthetic Track Surfacing System components shall be processed and installed by specially designed machinery and equipment. A mechanically operated paver with variable regulated speed and thermostatically controlled screed shall be used in the installation of the base mat. The wearing course shall be installed using automatic electronic portioning, which provides continuous mixing and feeding for an accurate, quality-controlled installation.

B. No hand mixing is allowed.

5.4 INSTALLATION

A. Base Course

The SBR granules and BEYPUR 300 shall be mixed on site to regulate the ratio/quantity of SBR, not to exceed 82% in the base mat portion of the system. The BEYPUR 300 shall be mixed with the SBR rubber so that a minimum of 20%, by weight, exists in the final mixture. This mixture is then mechanically installed using the paver.

B. Seal Coat

The two BEYPUR 200 components are mixed at the prescribed ratio homogeneously with a suitable mixing device. The coating is squeegee applied to the base mat, making it impermeable.

C. Wearing Course

The 1 to 3mm EPDM granules shall be integrated into the BEYPUR to achieve the full depth of the 5 mm wearing course. The resilient embedded textured finish shall be a dense matrix of exposed EPDM granules. The homogeneous wearing course shall be applied in situ with the base course.

* Final track surfacing colors are to be reviewed and approved during the submittal process prior to ordering and installation of track system. Please refer to the approved physical track surface sample and track surface color approval form included in your project track submittal package.

5.5 SITE CONDITIONS

A. Installation shall not take place if adjacent or concurrent construction generates excessive dust, abrasives, or any other by-product that, in the opinion of the installer, would be harmful to the track material, until completion of such works.

B. Apply Synthetic Track Surfacing in dry weather when pavement and atmospheric temperatures are fifty (50) degrees Fahrenheit or above and are anticipated to remain above fifty (50) degrees Fahrenheit for twenty-four (24) hours after completing application.

C. The maximum temperature cannot exceed 105 degrees at any point during a 24 - hour period.

D. Rain cannot be falling. If there is a threat of rain, work shall cease until dry conditions can be re-established on the track pavement. Work is to proceed only when adequate curing can be guaranteed by the manufacturer.

PART 6 LINE STRIPING AND EVENT MARKINGS

6.1 LAYOUT

A. Line striping and event markings shall be laid out in accordance with the owner and in reference to the project's governing body for current WORLD ATHLETICS (WA), NCAA, NFSHSA rules and or Owner requirements.

6.2 CERTIFICATION

A. Upon completion of the installation, the owner shall be supplied with all necessary computations and drawings as well as a letter of certification attesting to the accuracy of the markings.

PART 7 GUARANTEE

7.1 The BSS 300 Synthetic Track Surfacing System shall be fully guaranteed by a third party against faulty workmanship and material failure for a period of ten (10) years from the date of acceptance.

7.2 Synthetic surfacing material found to be defective because of faulty workmanship and/or material failure shall be replaced or repaired at no charge, upon written notification within the guarantee period.

END OF SECTION

SECTION 321823.53 - ATHLETIC AND RECREATIONAL SURFACING FOR PICKLEBALL COURTS AND PLAY AREAS – ASPHALT SURFACES

PART 1 GENERAL

1.1 GENERAL DESCRIPTION

A. Textured acrylic surfacing for asphalt pickleball courts and similar play areas.

1.2 RELATED SECTIONS

A. Related Work

1. Section 028700 – Site Furnishings
2. Section 321200 – Flexible Paving

B. References

1. National Asphalt Paving Association (NAPA)
2. United States Pickleball Association (USTA)
3. International Pickleball Federation (ITF)
4. American Sport Builders Association (ASBA)

1.3 QUALITY ASSURANCE

A. Surfacing shall conform to the guidelines of the ASBA for planarity.

B. All surface coatings products shall be supplied by a single manufacturer.

C. The contractor shall record the batch number of each product used on the site and maintain it through the warranty period.

D. The contractor shall provide the inspector, upon request, an estimate of the volume of each product to be used on the site.

E. The installer shall be an authorized applicator of the specified system.

F. The manufacturer's representative shall be available to help resolve material questions.

1.4 SUBMITTALS

A. Manufacturer specifications for components, color chart and installation instructions.

B. Authorized Applicator certificate from the surface system manufacturer.

E. ITF classification certificate for the system to be installed.

F. Reference list from the installer of at least 5 projects of similar scope done in each of the past 3 years.

G. Current Material Safety Data Sheets (MSDS).

H. Product substitution: If other than the product specified, the contractor shall submit at least 7 days prior to the bid date a complete type written list of proposed substitutions with sufficient data, drawings, samples and literature to demonstrate to the owners satisfaction that the proposed substitution is of equal quality and utility to that originally specified. Information must include a QUV test of at least 1000 hours illustrating the UV stability of the system. The color system shall have an ITF pace rating in Category 2. Under no circumstances will systems from multiple manufacturers be considered.

1.4 MATERIAL HANDLING AND STORAGE

A. Store materials in accordance with manufacturer specifications and MSDS.

B. Deliver product to the site in original unopened containers with proper labels attached.

C. All surfacing materials shall be non flammable.

1.5 GUARANTEE

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

1.6 INSTALLER QUALIFICATIONS

A. Installer shall be regularly engaged in construction and surfacing of acrylic pickleball courts, play courts or similar surfaces.

B. Installer shall be an Authorized Applicator of the specified surface system.

C. Installer shall be a builder member of the ASBA.

1.7 MANUFACTURER QUALIFICATIONS

A. System manufacturer shall provide documentation that the surface to be installed has been classified by the ITF as a medium pace surface.

B. System manufacturer shall be a US owned company.

C. System manufacturer shall be a member of the ASBA.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. California Products Corp., Andover, MA. 01810 / Plexipave System www.plexipave.com

B. Substitutions: Submit requests at least 7 days prior to the bid date with a complete type written list of proposed substitutions with sufficient data, drawings, samples and literature to demonstrate to the owners satisfaction that the proposed substitution is of equal quality and utility to the specified product. Information must include a QUV test of at least 1000 hours illustrating the UV stability of the system. The system shall have an ITF pace rating in

Category 2. Under no circumstance may the final color surface contain silica sand added at the job site.

2.2 MATERIALS

A. Patching Mix (California Court Patch Binder) - for use in patching cracks, holes, depressions and other surface imperfections.

B. Crack Filler (Plexipave Crack Filler) - for use in filling fine cracks.

C. Acrylic Filler Course (California Acrylic Resurfacer) – for use as a filler for new or existing asphalt surfaces. The 100% acrylic filler shall be blended with approved silica sand at the job site.

D. Acrylic Color Playing Surface (Plexichrome/Plexipave Color Base) – for use as the finish color and texture. Plexichrome and Plexipave Color Base are blended at the job site to achieve the correct surface texture. *Factory Fortified Plexipave may be used as an alternative material.

E. Line Paint (California Line Paint) – for use as the line marking on the court/play surface.

F. Water – for use in dilution/mixing shall be clean and potable.

2.3 MATERIAL SPECIFICATIONS

A. Court Patch Binder – 100% acrylic resin blended with Portland Cement and silica sand.

1) Percent solids by weight (minimum) 46%
2) Weight 8.7-8.9 lbs./gallon

B. Plexipave Crack Filler – 100% acrylic resin heavily filled with sand.

1) Percent solids by weight (minimum) 85%
2) Percent solids by weight (minimum) 15 lbs./gallon

C. California Acrylic Resurfacer – 100% acrylic resin (no vinyl copolymerization constituent). The product shall contain not less than 3.5% attapulgite.

1) Percent solids by weight (minimum) 26.7%
2) Weight 8.7-8.9 lbs./gallon

D. Plexichrome – 100% acrylic resin (no vinyl copolymerization constituent) with selected light fast pigments. Green shall contain not less than 8% chrome oxide.

1) Percent solids by weight (minimum) 36.5%
2) Weight 10.0-10.2 lbs./gallon

E. Plexipave Color Base – 100% acrylic resin containing no vinyl copolymerization constituent. Contains not more than 63% rounded silica sand.

1) Percent solids by weight (minimum) 74%
2) Weight 13.1-14.1 lbs./gallon

F. California Line Paint – 100% acrylic resin containing no alkyds or vinyl constituents. Texturing shall be rounded silica sand.

1) Percent solids by weight (minimum) 60.5%
2) Weight 12-12.3 lbs./gallon

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

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

PART 3 EXECUTION

3.1 WEATHER LIMITATIONS

A. Do not install when rainfall in imminent or extremely high humidity prevents drying.

B. Do not apply unless surface and air temperature are 50°F and rising.

C. Do not apply if surface temperature is in excess of 140°F.

3.2 PREPARATION FOR ACRYLIC COLOR PLAYING SYSTEM

A. Clean surfaces of loose dirt, oil, grease, leaves, and other debris in strict accordance with manufacturer's directions. Pressure washing will be necessary to adequately clean areas to be coated. Any areas previously showing algae growth shall be treated with Clorox or approved product to kill the organisms and then be properly rinsed.

B. Holes and cracks: Cracks and holes shall be cleaned and a suitable soil sterilant, as approved by the owner, shall be applied to kill all vegetation 14 days prior to use of **Court Patch Binder** according to manufacturer's specifications.

C. Depression: Depressions holding enough water to cover a five cent piece shall be filled with Court Patch Binder Patching Mix. 3 gallons of Court Patch Binder, 100 lbs. 60-80 silica sand, 1 gallon Dry Portland Cement (Type I). **This step shall be accomplished prior to the squeegee application of Acrylic Resurfacer.** The contractor shall flood all the courts and then allow draining. Define and mark all areas holding enough water to cover a nickel. After defined areas are dry, prime with tack coat mixture of 2 parts water/l part Court Patch Binder. Allow tack coat to dry completely. Spread Court Patch Binder mix true to grade using a straight edge (never a squeegee) for strike off. Steel trowel or wood float the patch so that the texture matches the surrounding area. Never add water to mix. Light misting on surface and edges to feather in is allowed as needed to maintain work ability. Allow to dry thoroughly and cure.

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

D. Filler Course. (Acrylic Resurfacer): Filler course shall be applied to the clean underlying surface in one application to obtain a total quantity of not less than .06 gallon per square yard

based on the material prior to any dilution. Acrylic Resurfacer may be used to pre-coat depression and crack/hole repairs to achieve better planarity prior to filler course application.

1. Over a properly repaired surface of asphalt on existing courts, apply one coat of Acrylic Resurfacer according to the following mix:

Acrylic Resurfacer	55 gallons
Water	20 - 40 gallons
Sand	600-800 pounds / 60-80 mesh
Liquid Yield	112-138 gallons

On new asphalt, two coats of Acrylic Resurfacer shall be used to properly fill all voids in the asphalt surface. Use clean, dry 50-60 mesh sand and clean, potable water to make mixes. The quantity of sand and water in the above mix may be adjusted within above limits to complement the roughness and temperature of the surface.

2. Mix the ingredients thoroughly using accepted mixing devices and use a 70 Durometer rubber bladed squeegee to apply each coat of Acrylic Resurfacer as required.

3. Allow the application of Acrylic Resurfacer to dry thoroughly. Scrape off all ridges and rough spots prior to any subsequent application of Acrylic Resurfacer or subsequent cushion or color surface system.

3.3 APPLICATION OF ACRYLIC COLOR PLAYING SURFACE

A. All areas to be color coated shall be clean, free from sand, clay, grease, dust, salt or other foreign matters. The Contractor shall obtain the Engineer's approval, prior to applying any surface treatment.

B. Blend color base and Plexichrome with a mechanical mixer to achieve a uniform Fortified Plexipave mixture. The mix shall be:

Color Base	30 gallons
Plexichrome	20 gallons
Water	20 gallons

C. Application shall be made by 50 durometer rubber faced squeegees. The Fortified Plexipave mixture should be poured on to the court surface and spread to a uniform thickness in a regular pattern.

D. A total of 3 applications of Fortified Plexipave shall be made to achieve a total application rate of not less than .15 gal./sy. No application should be made until the previous application is thoroughly dry.

3.4 LINE PAINTING

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

gal. per pickleball court).

3.5 PROTECTION

A. Erect temporary barriers to protect coatings during drying and curing.

B. Lock gates to prevent use until acceptance by the owner's representative.

3.6 CLEAN UP

A. Remove all containers, surplus materials and debris. Dispose of materials in accordance with local, state and Federal regulations.

B. Leave site in a clean and orderly condition

END OF SECTION

CHAIN LINK FENCE AND GATES

PART 1 GENERAL

1.01 DESCRIPTION

A. Section includes chain-link fences and swing gates.

1.02 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design chain-link fences and gates, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Chain-link fence and gate framework shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE/SEI 7:

1. Minimum Post Size: Determine according to ASTM F 1043 for framework up to 12 feet (3.66 m) high, and post spacing not to exceed 10 feet.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each polymer-coated product and for each color and texture specified, in 6-inch lengths for components and on full-sized units for accessories.

D. Delegated-Design Submittal: For chain-link fences and gate framework indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.04 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of chain-link fence and gate, from manufacturer.

B. Product Test Reports: For framing strength according to ASTM F 1043.

C. Sample of special warranty.

1.05 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.06 WARRANTY

A. Special Warranty: Manufacturer's standard form in which Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, deterioration of metals, metal finishes, and other materials beyond normal weathering.
2. Warranty Period: Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 CHAIN-LINK FENCE FABRIC

A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with CLFMI Product Manual and with requirements indicated below:

1. Fabric Height: As indicated on Drawings.

2. Wire diameter and mesh sizes in first two subparagraphs below are commonly available and are limited to certain heights depending on the usage of the fence. See ASTM standards and CLFMI Product Manual.

3. Retain first subparagraph below for steel wire fabric mesh. CLFMI limits wire diameter in last option to residential applications, but other standards do not make this distinction.

4. Steel Wire Fabric: Wire with a diameter of 0.148 inch.

a. Mesh Size: 2”
b. Zinc-Coated Fabric: ASTM A 392, Type II, Class 1, 1.2 oz./sq. ft. with zinc coating applied after weaving.
c. Polymer-Coated Fabric: ASTM F 668, Class 2b over zinc-coated steel wire. Refer to plans where polymer-coated fabric is not specified.

1) Color: as indicated in drawing details, complying with ASTM F 934.

2.02 FENCE FRAMING

A. Posts and Rails: Comply with ASTM F 1043 for framing, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 based on the following:

1. Fence Height: As indicated on Drawings.
2. Light Industrial Strength: Material Group IC-L, round steel pipe, electric-resistance-welded pipe

    a. Line Post: As indicated on Drawings.
    b. End, Corner and Pull Post: As indicated on Drawings.

3. Horizontal Framework Members: Intermediate, top, and bottom rails complying with ASTM F 1043.
4. Brace Rails: Comply with ASTM F 1043.
5. Metallic Coating for Steel Framing:

    a. Type A zinc coating.

6. Polymer coating over metallic coating.

    a. Color: as indicated in drawing details, complying with ASTM F 934. Refer to plans where polymer-coating is not specified.

2.03 TENSION WIRE

A. Metallic-Coated Steel Wire: 0.177-inch diameter, marcelled tension wire complying with ASTM A 817 and ASTM A 824, with the following metallic coating:

    1. Type I, aluminum coated (aluminized).

2.04 SWING GATES

A. General: Comply with ASTM F 900 for gate posts and single swing gate types.

    1. Gate Leaf Width: As indicated.
    2. Gate Fabric Height: As indicated.

B. Pipe and Tubing:

    1. Zinc-Coated Steel: Comply with ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framing.
    2. Gate Posts: Round tubular steel.
    3. Gate Frames and Bracing: Round tubular steel.

C. Frame Corner Construction: Welded.

D. Hardware:

    1. Hinges: 360-degree inward and outward swing.
    2. Latches permitting operation from both sides of gate.
    3. Knox Boxes.

2.05 FITTINGS

A. General: Comply with ASTM F 626.

B. Finish:

1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz. /sq. ft. zinc.

2. Polymer coating over metallic coating. See plans.

2.06 GROUT AND ANCHORING CEMENT

A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.

B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.

PART 3 - EXECUTION

3.01 INSTALLATION

C. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

E. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

F. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated.

G. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

H. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

I. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 30 degrees or more.

J. Line Posts: Space line posts uniformly as designated on the plans.

K. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Provide horizontal tension wire at the following locations:

1. As indicated.

L. Chain-Link Fabric: Apply fabric to inside of enclosing framework. Leave 2 inches between finish grade or surface and bottom selvage unless otherwise indicated.

M. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

N. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

O. All fences and gates will be accompanied with a concrete band at ground level; refer to the plans. Coordinate construction of it when erecting the fence or gates.

END OF SECTION

SECTION 323119 – DECORATIVE METAL FENCES AND GATES – ECHELON II

PART 1 GENERAL

1.01 WORK INCLUDED

A. The contractor shall provide all labor, materials and appurtenances necessary for installation of the industrial ornamental aluminum fence system defined herein.

1.02 RELATED WORK

A. Section 033000 – Cast in Place Concrete

B. Section 312000 – Earthwork

C. Section 320523 – Concrete for Exterior Improvements

1.03 SYSTEM DESCRIPTION

A. The manufacturer shall supply a total industrial ornamental aluminum fence system of the Ameristar® Echelon II®, Genesis™, design. The system shall include all components (i.e., pickets, rails, posts, gates and hardware) required.

1.04 QUALITY ASSURANCE

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

1.05 REFERENCES

A. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus.

B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.

C. ASTM D523 - Test Method for Specular Gloss.

D. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.

E. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.

F. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.

G. ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

H. ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

1.06 SUBMITTAL

A. The manufacturer's submittal package shall be provided prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

A. Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 – MATERIALS

2.01 MANUFACTURER

A. The industrial ornamental aluminum fence system shall conform to Ameristar Echelon II, Genesis, 3-Rail style manufactured by Ameristar Fence Products, Inc., in Tulsa, Oklahoma.

2.02 MATERIAL

A. Aluminum material for fence framework (i.e., tubular pickets, rails and posts) shall conform to the requirements of ASTM B221. The aluminum extrusions for posts and rails shall be Alloy and Temper Designation 6005-T52. The aluminum extrusions for pickets shall be Alloy and Temper Designation 6063-T52.

B. The manufactured framework shall be subjected to the Ameristar thermal stratification coating process (high-temperature, in-line, multi-stage, and multi-layer) including, as a minimum, a six-stage pretreatment/wash and an electrostatic spray application of a polyester finish. The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be Black. The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2.

C. Material for fence pickets shall be 1" square x 0.062" thick (.125" wall for Invincible) extruded tubing. The cross-sectional shape of the rails shall conform to the manufacturer's ForeRunner™ design with outside cross-section dimensions of 1.75" square. The top wall and internal web of the rail shall be 0.070" thick; the sidewalls shall be 0.070" thick for superior vertical load strength. Picket holes in the ForeRunner rail shall be spaced 4.715" o.c.. Picket retaining rods shall be 0.125" diameter galvanized steel. Fence posts and gate posts shall meet the minimum size requirements of Table 1. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections.

D. Bracket to rail attachments shall be made using specially designed one-way tamperproof security nuts with carriage bolt. Bracket to post connections shall be made using self-drilling hex-head screws.

E. Aluminum castings shall be used for all rings, post caps, finials, and miscellaneous adornments.

2.03 FABRICATION

A. Pickets, rails and posts shall be pre-cut to specified lengths. ForeRunner rails shall be pre-punched to accept pickets.

B. The rail inner slide shall be fully inserted into the rail outer channel to form the raceway for the internal retaining rod. Grommets shall be inserted into the pre-punched holes in the rails, and pickets shall be inserted through the grommets so that pre-drilled picket holes align with the internal raceway of the two-part ForeRunner rails. (Note: This can best be accomplished by using an alignment template). Retaining rods shall be inserted into each ForeRunner rail so that they pass through the pre-drilled holes in each picket, thus completing the panel assembly.

C. Completed panels shall be capable of supporting a 300 lb. load (applied at midspan) without permanent deformation. Panels shall be biasable to a 25% change in grade.

D. Gates shall be fabricated using 1.75” sq. reinforced ForeRunner rail material, 2” sq. x .250” gate ends, and 1” sq. x .125” pickets. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall be joined by welding.

PART 3 EXECUTION

3.01 PREPARATION

A. All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 FENCE INSTALLATION

A. Fence post shall be spaced according to Table 3, plus or minus ½”. For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to posts with brackets supplied by the manufacturer. Posts shall be set in concrete footers having a minimum depth of 36” (Note: In some cases, local restrictions of freezing weather conditions may require a greater depth). The “Earthwork” and “Concrete” sections of this specification shall govern material requirements for the concrete footer. Posts setting by other methods such as plated posts or grouted core-drilled footers are permissible only if shown by engineering analysis to be sufficient in strength for the intended application.

3.03 FENCE INSTALLATION MAINTENANCE

A. When cutting/drilling rails or posts adhere to the following steps to seal the exposed surfaces; 1) Remove all metal shavings from cut area. 2) Apply custom finish paint matching fence color. Failure to seal exposed surfaces per steps 1& 2 above will negate warranty. Ameristar spray cans or paint pens shall be used to prime and finish exposed surfaces; it is recommended that paint pens be used to prevent overspray. Use of non-Ameristar parts or components will negate the manufactures' warranty.

3.04 GATE INSTALLATION

A. Gate posts shall be spaced according to the manufacturers' gate drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected. Type and quantity of gate hinges shall be based on the application; weight, height, and number of gate cycles. The manufacturers' gate drawings shall identify the necessary gate hardware required for the application. Gate hardware shall be provided by the manufacture of the gate and shall be installed per manufacturer's recommendations.

3.05 CLEANING

A. The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Table 1 – Minimum Sizes for Echelon II Posts	
Fence Posts	Panel Height
2-1/2" x 2-1/2" x .080" Alum. w/ reinforced web	Up to & Including 6' Height
3" x 3" x .120" Alum.	Over 6' Up to & Including 8' Height
4" x 4" x .250" Alum.	Over 8' Height Up to 10'

Gate Leaf	Gate Height			
	Up to & Including 4'	Over 4' Up to & Including 6'	Over 6' Up to & Including 8'	Over 8' Up to & Including 10'
Up to 4'	3" x 3" x .120" Alum.	4" x 4" x .250 Alum. or 3" x 12 Ga. steel	4" x 11 Ga. steel	4" x 11 Ga. steel
4'1" to 6'	4" x 4" x .250 Alum. or 3" x 12Ga. steel	3" x 12 Ga. steel	4" x 11 Ga. steel	4" x 11 Ga. steel
6'1" to 8'	4" x 11 Ga. steel	4" x 11 Ga. steel	4" x 11 Ga. steel	6" x 3/16" steel
8'1" to 10'	4" x 11 Ga. steel	4" x 11 Ga. steel	6" x 3/16" steel	6" x 3/16" steel
10'1" to 12'	4" x 11 Ga. steel	6" x 3/16" steel	6" x 3/16" steel	6" x 3/16" steel
12'1" to 14'	6" x 3/16" steel	6" x 3/16" steel	6" x 3/16" steel	6" x 3/16" steel

Table 2 – Coating Performance Requirements		
Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117 & D1654	Corrosion Resistance over 1,000 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822 D2244, D523 (60˚ Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Table 3 – Echelon II – Post Spacing By Bracket Type								
Span	For INVINCIBLE® 8' Nominal (91.25" Rail)		For CLASSIC, GENESIS, & MAJESTIC 8' Nominal (92.625" Rail)					
Post Size	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"
Bracket Type	Industrial Flat Mount (BB301)		Industrial Universal (BB302)	Industrial Universal (BB303)	Industrial Flat Mount (BB301)		Industrial Swivel (BB304)*	
Post Settings ± ½" O.C.	94-1/2"	95"	96"	96.5"	96"	96-1/2"	*97.5"	*98"
Span	For INVINCIBLE® 6' Nominal (71.375" Rail)		For CLASSIC, GENESIS, & MAJESTIC 6' Nominal (67.75" Rail)					
Post Size	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"
Bracket Type	Industrial Flat Mount (BB301)		Industrial Universal (BB302)	Industrial Universal (BB303)	Industrial Flat Mount (BB301)		Industrial Swivel (BB304)*	

Post Settings ± ½" O.C.	75"	75.5"	71.5"	72"	71.5""	72"	*73"	*73.5"
*Note: When using BB304 swivel brackets on either or both ends of a panel installation, care must be taken to ensure the spacing between post and adjoining pickets meets applicable codes. This will require trimming one or both ends of the panel.								

END OF SECTION

SECTION 323119 – DECORATIVE METAL FENCES AND GATES – MONTAGE II

PART 1 GENERAL

1.01 WORK INCLUDED

A. The contractor shall provide all labor, materials and appurtenances necessary for installation of the welded ornamental steel fence system defined herein.

1.02 RELATED WORK

A. Section 033000 – Cast in Place Concrete

B. Section 312000 – Earthwork

C. Section 320523 – Concrete for Exterior Improvements

1.03 SYSTEM DESCRIPTION

A. The manufacturer shall supply a total fence system of Montage II® ***Welded and Rackable*** (ATF – All Terrain Flexibility) Ornamental Steel, Genesis™ design. The system shall include all components (i.e., panels, posts, gates and hardware) required.

1.04 QUALITY ASSURANCE

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

1.05 REFERENCES

A. AS ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

B. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus.

C. ASTM D523 - Test Method for Specular Gloss.

D. ASTM D714 - Test Method for Evaluating Degree of Blistering in Paint.

E. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.

F. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.

G. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.

H. ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

I. ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

J. ASTM F2408 – Ornamental Fences Employing Galvanized Steel Tubular Pickets.

1.06 SUBMITTAL

A. The manufacturer's literature shall be submitted prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

A. Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

1.08 PRODUCT WARRANTY

A. All structural fence components (i.e. rails, pickets, and posts) shall be warranted within specified limitations, by the manufacturer for a period of 20 years from date of original purchase. Warranty shall cover any defects in material finish, including cracking, peeling, chipping, blistering or corroding.

B. Reimbursement for labor necessary to restore or replace components that have been found to be defective under the terms of manufactures warranty shall be guaranteed for five (5) years from date of original purchase.

PART 2 MATERIALS

2.01 MANUFACTURER

A. The fence system shall conform to Montage II® *Welded and Rackable* (ATF – All Terrain Flexibility) Ornamental Steel, Genesis™ design, flush bottom rail treatment, 3-Rail style manufactured by Ameristar Fence Products, Inc., in Tulsa, Oklahoma.

2.02 MATERIAL

A. Steel material for fence panels and posts shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (310 MPa) and a minimum zinc (hot-dip galvanized) coating weight of 0.90 oz/ft2 (276 g/m2), Coating Designation G-90.

B. Material for pickets shall be 1" square x 14 Ga. tubing. The rails shall be steel channel, 1.75" x 1. 75" x .105". Picket holes in the rail shall be spaced 4.715" o.c. Fence posts and gate posts shall meet the minimum size requirements of Table 1.

2.03 FABRICATION

A. Pickets, rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.

B. Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture. The aligned pickets and rails shall be joined at each picket-to-rail intersection by Ameristar's proprietary fusion welding process, thus completing the rigid panel assembly (Note: The process produces a virtually seamless, spatter-free good-neighbor appearance, equally attractive from either side of the panel).

C. The manufactured panels and posts shall be subjected to an inline electrodeposition coating (E-Coat) process consisting of a multi-stage pretreatment/wash, followed by a duplex application of an epoxy primer and an acrylic topcoat. The minimum cumulative coating thickness of epoxy and acrylic shall be 2 mils (0.058 mm). The color shall be Black. The coated panels and posts shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2 (Note: The requirements in Table 2 meet or exceed the coating performance criteria of ASTM F2408).

D. The manufactured fence system shall be capable of meeting the vertical load, horizontal load, and infill performance requirements for Industrial weight fences under ASTM F2408.

E. Swing gates shall be fabricated using 1.75" x 14ga Forerunner double channel rail, 2" sq. x 12ga. gate ends, and 1" sq. x 14ga. pickets. Gates that exceed 6' in width will have a 1.75" sq. x 14ga. intermediate upright. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding. Gusset plates will be welded at each upright to rail intersection. Cable kits will be provided for additional trussing for all gates leaves over 6'.

F. Pedestrian swing gates shall be self-closing, having a gate leaf no larger than 48" width. Integrated hinge-closer set (2 qty) shall be ADA compliant that shall include a variable speed and final snap adjustment with compact design (no greater than 5" x 6" footprint). Hinge-closer set (2 qty) shall be tested to a minimum of 500,000 cycles and capable of self-closing gates up to a maximum gate weight of 260 lbs. and maximum weight load capacity of 1,500 lbs. Hinge-closer device shall be externally mounted with tamper-resistant security fasteners, with full range of adjustability, horizontal (.5" - 1.375") and vertical (0 - .5"). Maintenance free hinge-closer set shall be tested to operate in temperatures of negative 20 F to 200 F degrees, and swings to negative 2 degrees to ensure reliable final lock engagement.

PART 3 EXECUTION

3.01 PREPARATION

A. All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 FENCE INSTALLATION

A. Fence post shall be spaced according to Table 3, plus or minus ½". For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to posts with brackets supplied by the manufacturer. Posts shall be set in concrete footers having a minimum depth of 36" (Note: In some cases, local restrictions of freezing weather conditions may require a greater depth). The "Earthwork" and "Concrete" sections of this specification shall govern material requirements for the concrete footer. Posts setting by other methods such as plated posts or grouted core-drilled footers are permissible only if shown by engineering analysis to be sufficient in strength for the intended application.

3.03 FENCE INSTALLATION MAINTENANCE

A. When cutting/drilling rails or posts adhere to the following steps to seal the exposed steel surfaces; 1) Remove all metal shavings from cut area. 2) Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry. 3) Apply 2 coats of custom finish paint matching fence color. Failure to seal exposed surfaces per steps 1-3 above will negate warranty. Ameristar spray cans or paint pens shall be used to prime and finish exposed surfaces; it is recommended that paint pens be used to prevent overspray. Use of non-Ameristar parts or components will negate the manufactures' warranty.

3.04 GATE INSTALLATION

A. Gate posts shall be spaced according to the manufacturers' gate drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected. Type and quantity of gate hinges shall be based on the application; weight, height, and number of gate cycles. The manufacturers' gate drawings shall identify the necessary gate hardware required for the application. Gate hardware shall be provided by the manufacturer of the gate and shall be installed per manufacturer's recommendations.

3.05 CLEANING

A. The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Table 1 – Minimum Sizes for Montage II Posts			
Fence Posts	Panel Height		
2-1/2" x 12 Ga.	Up to & Including 6' Height		
3" x 12 Ga.	Over 6' Up to & Including 8' Height		
Gate Leaf	Gate Height		
	Up to & Including 4'	Over 4' Up to & Including 6'	Over 6' Up to & Including 8'
Up to 4'	2-1/2" x 12 Ga.	3" x 12 Ga.	3" x 12 Ga.
4'1" to 6'	3" x 12Ga.	4" x 11 Ga.	4" x 11 Ga.
6'1" to 8'	3" x 12 Ga.	4" x 11 Ga.	6" x 3/16"
8'1" to 10'	4" x 11 Ga.	6" x 3/16"	6" x 3/16"
10'1" to 12'	4" x 11 Ga.	6" x 3/16"	6" x 3/16"
12'1" to 14'	4" x 11 Ga.	6" x 3/16"	6" x 3/16"
14'1" to 16'	6" x 3/16"	6" x 3/16"	6" x 3/16"

Table 2 – Coating Performance Requirements		
Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 1,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822 D2244, D523 (60˚ Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

	Table 3 – Montage II – Post Spacing By Bracket Type									
Span	For INVINCIBLE® 8' Nominal (91-1/2" Rail)				For CLASSIC, GENESIS, & MAJESTIC 8' Nominal (92-5/8" Rail)					
Post Size	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"
Bracket Type	Industrial Flat Mount (BB301)*		Industrial Line 2-1/2" (BB319) 3" (BB320)		Industrial Universal 2.5" (BB302) 3" (BB303)		Industrial Flat Mount (BB301)		Industrial Swivel (BB304)*	
Post Settings ± ½" O.C.	94-1/2"	95"	94-1/2"	95"	96"	96-1/2"	96"	96-1/2"	*96"	*96-1/2"
*Note: When using BB304 swivel brackets on either or both ends of a panel installation, care must be taken to ensure the spacing between post and adjoining pickets meets applicable codes. This will require trimming one or both ends of the panel. When using the BB301 flat mount bracket for Invincible style, rail may need to be drilled to accommodate rail to bracket attachment.										

END OF SECTION

SECTION 329200 – TURF AND GRASSES

PART 1 GENERAL

1.01 DESCRIPTION

A. Furnish and install all appropriate work items.

1.02 RELATED DOCUMENTS

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

B. Related work specified elsewhere:
1. Section 028100 - Irrigation
2. Section 029110 - Landscape Soil Preparation
3. Section 029340 - Planting
4. Section 029350 - Landscape Maintenance

1.03 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See drawing designations for planting soils.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete or the top surface of a fill or backfill before planting soil is placed.

1.04 SUBMITTALS

A. Qualification Data: For landscape Installer.

B. Certification of Grass Seed - From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging:
1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.

C. Product Certificates: For fertilizers, from manufacturer.

D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project. Submit a written recommendation from a State of California appropriately licensed individual along with complete product data from proposed manufacturer, for review by Construction Manager.

E. Sustainable Design Submittals:
1. Credit MR 5: Product Data for regional materials indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project and cost for each regional material.

1.05 QUALITY ASSURANCE

A. Installer Qualifications - A qualified landscape installer whose work has resulted in successful turf establishment:
1. Experience: Five years' experience in turf installations similar in material and extent to that indicated for this project, and a record of successful landscape establishment, in addition to requirements in the General Conditions Requirements.
2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
3. Pesticide Applicator: State licensed, commercial.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Bulk Materials:
1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

PART 2 PRODUCTS

2.01 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

B. Turf Seed: At least 98% pure, weed-free mixture and a minimum of 85% germination, recleaned, Grade A "new Crop" seed, delivered in the original

containers, unopened and bearing a guaranteed analysis and dealer's label. Mixture per plan.

C. Molate Red Fescue: Refer to the plans.

2.02 FERTILIZERS: REFER TO APPENDIX ‘A’ HORTICULTURAL SOILS REPORT.

2.03 PESTICIDES

A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction. The licensed individual shall review all planting, including, the types and extent of soil preparation, the irrigation systems, drainage patterns, and other project characteristics to verify type, compatibility, and recommend the appropriate herbicide(s) for use. Contractor shall be responsible for all overspray, spreading, runoff, plant health, and other impacts from the use of the herbicide.
   1. When using pesticides and herbicides on school property, the contractor shall post 72 hours prior and leave posting up for 72 hours after. Contractor shall not spray if it is windy. If the herbicide product is not currently on Merced School District’s website or in their binders and files, the contractor shall get product approval from Merced School District’s Risk Management team before applying the herbicide.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

PART 3 EXECUTION

3.01 FIELD CONDITIONS

A. Retain "Planting Restrictions" Paragraph below to restrict planting times:
   1. Planting Restrictions: Sodding of permanent lawns to occur from March 15 through November 30. Sodding operations at other times shall be only with the approval of the Owner’s Representative and at the Contractor’s risk.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer’s written instructions.

3.02 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work:
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   3. Uniformly moisten excessively dry soil that is not workable, or which is dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.03 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations:
   1. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil- bearing water runoff or airborne dust to adjacent properties and walkways.

3.04 TURF AREA PREPARATION

A. General: Prepare planting area for soil placement and mix planting soil according to Landscape Architect directive.

B. Placing Planting Soil - Place planting soil in place over exposed subgrade:
   1. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

D. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.05 SEEDING

A. Do not seed if dormant or if ground is frozen or muddy.

3.06 TURF RENOVATION

A. Renovate existing turf where indicated.

B. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles:
   1. Reestablish turf where settlement or washouts occur or where minor regrading is required.

2. Install new planting soil as required.

C. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

D. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

E. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

G. Till stripped, bare, and compacted areas thoroughly per Section 029110.

H. Apply initial fertilizer required for establishing new turf and mix per Section 029110. Install new planting soil to fill low spots and meet finish grades.

I. Apply seed as required for new turf.

J. Water newly planted areas and keep moist until new turf is established.

3.07 TURF MAINTENANCE

A. General - Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation:
   1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
   2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
   3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering - Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches (100 mm):
   1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
   2. Water turf with fine spray at a minimum rate of 1 inch (25 mm) per week unless rainfall precipitation is adequate.

C. Turf Post-fertilization – Refer to Appendix ‘A’, Horticultural Soils Report.

3.08 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Architect:
   1. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.09 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed. When using pesticides and herbicides on school property, the contractor shall post 72 hours prior and leave posting up for 72 hours after. Contractor shall not spray if it is windy. If the herbicide product is not currently on Merced School District's website or in their binders and files, the contractor shall get product approval from Merced School District's Risk Management team before applying the herbicide.

B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already- germinated weeds and according to manufacturer's written recommendations.

3.10 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove non-degradable erosion-control measures after grass establishment period.

3.11 MAINTENANCE SERVICE

A. Turf Maintenance Service - Provide full maintenance by skilled employees of landscape installer. Maintain as required in "Turf Maintenance" Article. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:
   1. Sodded Turf: 90 days from date of planting completion.

END OF SECTION

SECTION 330516 - UTILITY STRUCTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manhole structures for gravity storm drain and sanitary sewer utilities.

1.02 RELATED DOCUMENTS

A. AASHTO:

1. M 199: Standard Specification for Precast Reinforced Concrete Manhole Sections.

B. ASTM:

1. A 615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

2. C 478: Standard Specification for Circular Precast Reinforced Concrete Manhole Sections.

3. C 1244: Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.

C. Caltrans Standard Specifications.

1. Section 51, Concrete Structures.

2. Section 75, Miscellaneous Metal.

D. California Building Code.

1. Section 1110A - Exterior Accessible Routes.

1.03 DEFINITIONS

A. AASHTO: American Association of State Highway and Transportation Officials.

B. ASTM: American Society for Testing Materials.

1.04 SUBMITTALS

A. Follow submittal procedures outlined in Division 01 Specifications.

B. Product data for the following:

1. Cleanout plugs or caps.

C. Shop drawings: Include plans, elevations, details and attachments for the following:

1. Precast concrete manholes, frames and covers.

2. Precast concrete clean out boxes and box covers.

D. Design Mix Reports and Calculations: For each class of cast-in-place concrete.

E. Field Test Reports: Indicate and interpret test results for compliance with performance.

1.05 DELIVERY, STORAGE AND HANDLING

A. Handle precast concrete manholes according to manufacturer's written instructions.

B. Protect imported bedding and backfill material from contamination by other materials.

PART 2 PRODUCTS

2.01 CLEANOUTS

A. Piping: Same as sanitary sewer line if possible.

B. Top Cap: Threaded and of same material as piping if possible.

C. Box Size: As required to provide access and allow easy removal and reinstallation of cap.

D. Box Types:

1. Landscape Areas: Portland cement concrete box and box cover (bolt-down), light duty.

2. Traffic Areas: Portland cement concrete box and box cover or steel or cast iron cover, heavy duty, both box and cover (bolt down) to be rated for AASHTO H20 loading.

E. Box Cover Markings: "S.D." for storm drain cleanouts, "S.S." for sanitary sewer cleanouts, unless otherwise specified.

F. Available Manufacturers: Subject to compliance with requirements, box manufacturers offering products that may be incorporated into the Project include, but are not limited or approved equal to the following:

1. Associated Concrete Products, Inc. (Santa Ana, California) (Tel. 714-557-7470).

2. Brooks Products Inc. (El Monte, California) (Tel. 818-443-3017).

3. Christy Concrete Products, Inc. (Fremont, California) (Tel. 800-486 7070).

2.02 MANHOLES

A. General: Size, shape, configuration, depth, etc. of manhole and frame and cover shall be as indicated.

B. Portland Cement Concrete and Reinforcing:

1. Cast-In-Place Portion: Use Class A Concrete per Caltrans Standard Specification Section 90, and ASTM A615 Grade 60 reinforcing steel bars.

2. Precast Portion: ASTM C 478. Rate for AASHTO H20 loading in traffic areas.

C. Frames and Covers: As indicated and in accordance with Caltrans Standard Specification Section 75-2.

D. Steps: ASTM C 478 or AASHTO M 199. Manufacture from deformed, ½-inch steel reinforcement rod complying with ASTM A 615 and encased in polypropylene complying with ASTM D4101. Include pattern designed to prevent lateral slippage off step. Acceptable manufacturer is Hanson Concrete Products, (Milpitas, CA) (Tel 408-262-1091) or approved equal.

E. Force Main Piping Access Openings:

1. General: As indicated.

2.03 JOINT SEALANT FOR STRUCTURES AND MANHOLES

A. Mortar: Caltrans Standard Specification Sections 51-1.02F and 51-1.03E.

1. Use to seal around pipes at connections to structures and manholes. Also use to seal joints between precast sections of structures and manholes.

B. Gaskets: Preformed flexible rubber or plastic gasket.

1. Rubber Gaskets: ASTM C443.

2. Plastic Gaskets: Federal Specification SS-S-00210 (GSA-FSS), Type I, Rope Form; or alternate standard which may exist. Acceptable material is “Ram-Nek,” as manufactured by the K. T. Snyder Company (Houston TX), or approved equal.

PART 3 EXECUTION

3.01 CLEANOUT INSTALLATION

A. General: Install as indicated.

3.02 MANHOLE INSTALLATION

A. General: Install as indicated.

3.03 TESTING OF MANHOLES ON GRAVITY LINES

A. At the option of the Contractor, either the following hydrostatic or vacuum test shall be performed.

B. Hydrostatic Test:

1. Insert inflatable plugs in all sewer inlets and outlets.

2. Fill the manhole with water to a point six inches below the base of the manhole frame.

3. Maintain the water at this point for one hour to allow time for absorption.

4. Begin one-hour test period. Measure the amount of water added in one-hour period to maintain the water level at six inches below the base of the manhole frame. Do not allow water level to drop more than 25% of the manhole depth.

5. Determine the allowable leakage by the following formula.

6. L=0.0002 x D X H 1/2

7. L = Allowable leakage, gallons per minute.

8. D = Depth of manhole from top to bottom, feet.

9. H = Head of water in feet as measured from the surface of the water in the manhole to the sewer line invert or to the prevailing ground water surface outside the manhole. The lesser height governs.

10. If the leakage exceeds the allowable, determine the cause, take remedial action and re-test the manhole. If the leakage is less than the allowable and leaks are observed, repair the leaks.

C. Vacuum Test:

1. General: Test in accordance with ASTM C 1244.

2. Test prior to backfilling around the manhole.

3. Test Preparation: Plug all lift holes and pipes entering or exiting the manhole.

4. Place test head inside the top section of the manhole's cone section and inflate in accordance with the manufacturers instructions.

5. Draw a vacuum of 10-inches of mercury and shut the pump off.

6. With the valve closed, the time for the vacuum to drop 9-inches shall be measured.

7. The manhole shall pass the test if the time is greater than 60 seconds for a 48-inch diameter manhole, 75 seconds for a 60-inch diameter manhole and 90 seconds for a 72-inch diameter manhole.

8. If the manhole fails the initial test, make necessary repairs with a non-shrink grout while the vacuum is still being drawn. Retest until a satisfactory test is obtained.

END OF SECTION

SECTION 331000 – WATER UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Site water distribution system for domestic services up to 5 feet of any on-site building being served.

B. Domestic water transmission or distribution system within a roadway or street right-of-way.

1.02 RELATED SECTIONS

A. Section 31 23 33 – Trenching and Backfilling.

B. Section 32 05 23 – Concrete for Exterior Improvements.

1.03 RELATED DOCUMENTS

A. ASTM:

1. A 536: Standard Specification for Ductile Iron Castings.
2. B 88: Standard Specifications for Seamless Copper Water Tube.
3. D 1785: Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
4. D 2564: Standard Specifications for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.

B. AWWA:

1. C104: Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
2. C105: Polyethylene Encasement for Ductile-Iron Pipe Systems.
3. C110: Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (76 mm Through 1,219 mm) for Water.
4. C111: Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
5. C115: Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
6. C150: Thickness Design of Ductile Iron Pipe.
7. C151: Ductile-Iron Pipe, Centrifugally Cast.
8. C153: Ductile- Iron Compact Fittings.
9. C200: Steel Water Pipe-6 In. (150 mm) and larger.

10. C203: Coal-Tar Protective Coatings and Linings for Steel Water Pipelines-Enamel and Tape-Hot Applied.
11. C205: Cement-Mortar Protective Lining and Coating for Steel Water Pipe- 4 In. and Larger-Shop Applied.
12. C207: Steel Pipe Flanges for Waterworks Service-Sizes 4 In. Through 144 In. (100 mm Through 3,600 mm).
13. C208: Dimensions for Fabricated Steel Water Pipe Fittings.
14. C209: Cold-Applied Tape Coatings for Steel Water Pipe, Special Sections, Connections and Fittings.
15. C210: Liquid-Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
16. C213: Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
17. C214: Tape Coatings for Steel Water Pipe.
18. C218: Liquid Coatings for Aboveground Steel Water Pipelines and Fittings.
19. C219: Bolted Sleeve-Type Couplings for Plain-End Pipe.
20. C500: Metal-Seated Gate Valves for Water Supply Service.
21. C504: Rubber-Seated Butterfly Valves, 3 In. (75 mm) through 72 In. (1,800 mm).
22. C507: Ball Valves 6 In. through 60 In. (150 mm Through 1,500 mm).
23. C508: Swing-Check Valves for Waterworks Service, 2-In. Through 48-In. (50-mm Through 1200-mm) NPS.
24. C509: Resilient-Seated Gate Valves for Water Supply Service.
25. C511: Reduced-Pressure Principle Backflow Prevention Assembly.
26. C512: Air Release, Air/Vacuum, and Combination Air Valves for Water and Wastewater Service.
27. C550: Protective Interior Coatings for Valves and Hydrants.
28. C600: Installation of Ductile-Iron Mains and Their Appurtenances.
29. C605: Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings.
30. C606: Grooved and Shouldered Joints.
31. C651: Disinfecting Water Mains.
32. C800: Underground Service Line Valves and Fittings.

33. C900: Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In. (100mm Through 1,500 mm).

34. C901: Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13mm) Through 3 In. (76mm) for Water Service.

35. C905: Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. Through 48 In. (350 mm Through 1,200 mm) for Water Transmission and Distribution.

36. C906: Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (100 mm Through 1,650 mm), for Waterworks.

37. C907: Injection-Molded Polyvinyl Chloride (PVC) Pressure Fittings, 4 In. Through 12 In. (100 mm Through 300 mm), for Water, Wastewater, and Reclaimed Water Service.

38. M11: Steel Pipe - A Guide for Design and Installation.

39. M23: PVC Pipe – Design and Installation.

40. M41: Ductile-Iron Pipe and Fittings.

1.04 DEFINITIONS

A. AASHTO: American Association of State Highway and Transportation Officials.

B. ASTM: American Society for Testing Materials.

C. AWWA: American Waterworks Association

D. DI: Ductile iron.

E. DIP: Ductile iron pipe.

F. FM: Factory Mutual.

G. NSF: National Sanitation Foundation.

H. PCC: Portland cement concrete.

I. PE: Polyethylene.

J. PVC: Polyvinyl Chloride.

K. UL: Underwriters Laboratory.

1.05 SYSTEM PERFORMANCE REQUIREMENTS

A. Minimum Internal Pressures: As indicated on plans.

B. External Load: Earth load indicated by depth of cover plus AASHTO H20 live load unless indicated otherwise.

1.06 SUBMITTALS

A. Follow submittal procedures outlined in Division 01 Specifications.

B. Product Data: For the following:

1. Piping materials and fittings.
2. Pipe couplings.
3. Flexible pipe fittings.
4. Restrained pipe fittings.
5. High deflection fittings/ball joints.
6. Expansion joints.
7. Flexible expansion joints.
8. Gate valves.
9. Butterfly valves.
10. Check valves.
11. Air and vacuum relief valves.
12. Blow-off valves.
13. Pressure reducing valves.
14. Pressure sustaining valves.
15. Ball valves.
16. Post indicator valves.
17. Backflow preventers.
18. Precast valve boxes and box covers.

C. Shop drawings: Include plans, elevations, details and attachments.

1. Precast and cast in-place vaults and covers.
2. Wiring diagrams for alarm devices.

D. Field test reports: Indicate and interpret test results for compliance with the Project requirements.

1.07 QUALITY ASSURANCE

A. Comply with requirements of utility supplying water. Do not operate existing valves or tap

existing piping without written permission and/or presence of utility company representative.

B. Comply with the following requirements and standards:

1. NSF 61: “Drinking Water System Components-Health Effects” for materials for potable water.

2. NFPA 70: “National Electric Code” for electrical connections between wiring and electrically operated devices.

C. Provide listing/approval stamp, label, or other marking on piping and specialties made to a specified standard.

1.08 MATERIAL 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. 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.

C. Handling: Use slings to handle valves whose 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. 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. Protection from Weather: Store indoors and maintain temperature higher than ambient dew-point temperature. Store indoors and maintain temperature higher than ambient dew point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

E. Do not store plastic pipe and fittings in direct sunlight.

F. Protect pipe, fittings, flanges, seals and specialties from moisture, dirt and damage.

G. Protect linings and coatings from damage.

H. Handle precast boxes, vaults and other precast structures according to manufacturer’s written instructions.

I. Protect imported bedding and backfill material from contamination by other materials.

1.09 COORDINATION

A. Coordinate connection to existing water mains with water utility supplying water.

B. Coordinate piping materials, sizes, entry locations, and pressure requirements with building domestic water distribution piping.

PART 2 PRODUCTS

2.01 SMALL-SIZE SERVICE PIPES

A. Copper Pipe: Sizes ¾-inch through 2-inch.

1. Pipe and Fittings: ASTM B 88, Type K, seamless water tube, annealed.

2. Joints: Restrain by couplings.

B. PE Plastic Pipe: Sizes ½-inch through 3-inch.

1. Pipe and Fittings: AWWA C901.

2. Joints: Restrain with clamps or heat-fusion.

C. PVC Pipe: Sizes1/8-inch through 3 inch.

1. Pipe and Fittings: ASTM D 1785, Schedule 40

2. Joints: Restrain with solvent cement. Do not use threaded pipe.

3. Solvent Cement: ASTM D2564.

2.02 HIGH DEFLECTION FITTINGS/BALL JOINTS

A. Plain End Pipe: Xtra Flex Restrained Joint High Deflection Fittings, 4-inch through 24-inch, U. S. Pipe, (Birmingham, AL) (Tel. 205-254-7442) or approved equal.

B. Mechanical or Flanged Joint: Flex 900, 4-inch through 12-inch, Ebaa Iron Sales, (Eastland, TX) (Tel. 800-433-1716) or approved equal.

2.03 EXPANSION JOINTS

A. TR Flex Joints: TR Flex Telescoping Sleeve, 4-inch through 64 inch, U. S. Pipe, (Birmingham, AL) (Tel. 205-254-7442).

B. Mechanical or Flanged Joint: Ex-Tend 200, 4-inch through 36-inch, EBAA Iron Sales, (Eastland, TX) (Tel. 800-433-1716) or approved equal.

2.04 FLEXIBLE EXPANSION JOINTS

A. Plain End to Plain End Pipe: “Xtra Flex,” sizes 4-inch through 24-inch, U. S. Pipe, (Birmingham AL) (Tel. 205-254-7442) or approved equal.

B. Flanged or mechanical Joint: “Flex-Tend,” sizes 3-inch through 48-inch, Ebaa Iron

(Eastland TX) (Tel. 800-433-1716) or approved equal.

C. Flanged Joint: Starflex, Series 500, Star Pipe Products, (Tel. 800-999-3009) or approved equal.

2.05 GATE VALVES

A. Provide on lines 10-inch and smaller.

B. Valves, 3-Inch through 20-Inch: AWWA C509, resilient-seated, non-rising stem, gray or ductile-iron body and bonnet, with bronze or gray or ductile-iron gate, bronze stem and square stem operating nut unless noted otherwise. All bolts, nuts and washers, except operating nut, shall be stainless steel. Stem operating nut to be 2-inches square and open counter-clockwise. Stem extensions shall be installed to bring the stem operating nut to within 2-feet of finish grade where the depth from finish grade to the stem operating nut exceeds 4-feet. Equip valves in pump stations and other interior or vault installations with hand-wheels. Provide protective epoxy interior and exterior coating according to AWWA C550 and manufacturer's recommendations.

C. Service Line Valves and Fittings, 2-Inch and Smaller: AWWA C800

D. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:

1. Mueller Company (Decatur, IL) (Tel.800-423-1323).

2. M&H Valve Company (Anniston, AL) (Tel. 205-237-3521).

3. Crane Company (New York, NY).

E. Valve Box and Cover: 9-inch minimum diameter PCC box with extensions of length required for depth of bury of valve, and cast iron or ductile iron cover with lettering "WATER". Both the box and the cover shall be rated for AASHTO H20 loading.

2.06 BUTTERFLY VALVES

A. Provide on lines larger than 10-inch.

B. Valves, 3-Inch through 72-Inch: AWWA C 504, rubber seated, Class 150B cast iron body, cast or ductile iron discs, stainless steel shafts, adjustable field replaceable rubber seats mating against stainless steel seat rings and field-replaceable seals. Flanged or mechanical joint end connections. No wafer type valves allowed. Traveling nut type valve actuators designed for buried service unless noted otherwise. All bolts, nuts and washers, except wrench nut, shall be stainless steel. Wrench nut to be 2-inches square and open counter-clockwise. Stem extensions shall be installed to bring the wrench nut to within 2-feeet of finish grade where the depth from finish grade to the wrench nut exceeds 4-feet. Equip valves in pump stations and other interior or vault installations with hand-wheels. Provide protective epoxy interior and exterior coating according to AWWA C550 and manufacturer's recommendations.

C. Available Manufacturers: Subject to compliance with requirements, manufacturers

offering products that may be incorporated into the Project include, but are not limited or approved equal to the following:

1. Mueller Company (Decatur, IL) (Tel.800-423-1323).
2. M&H Valve Company (Anniston, AL) (Tel. 205-237-3521).
3. Crane Company (New York, NY).

D. Valve Box and Cover: 9-inch minimum diameter PCC box with extensions of length required for depth of bury of valve, and cast iron or ductile iron cover with lettering "WATER". Both the box and the cover shall be rated for AASHTO H20 loading.

2.07 AIR RELEASE, AIR/VACUUM AND COMBINATION AIR VALVES

A. AWWA C512, specific type of valve, size, details and valve box as indicated.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:

1. Apco Valves, Valve and Primer Corporation (Schaumburg, IL) (Tel. 708-529-9000).
2. Crispin Valve (Berwick, PA) (Tel. 800-247-8258).

2.08 BLOW-OFF VALVES

A. Blow-off valve assemblies, details and boxes as indicated.

2.09 SWING CHECK VALVES

A. Valves 2-Inch through 24-Inch: AWWA C508, details as indicated.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:

1. Mueller Company (Decatur, IL) (Tel.800-423-1323).
2. M&H Valve Company (Anniston, AL) (Tel. 205-237-3521).

2.10 BALL VALVES

A. Valves 6-Inch through 48-Inch: AWWA C507, details as indicated.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:

1. Crane Company (New York, NY).

2.11 PRESSURE-REGULATING VALVES

A. Valve: Automatic, pilot-operated, cast-iron body with interior coating according to AWWA C550. 250-psi Working-pressure, bronze pressure-reducing pilot valve and tubing, and means for discharge pressure adjustment. Details as indicated.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:

1. Cla-Val Company (Newport Beach, CA) (Tel. 714-548-2201).

2. Bermad (Porterville, CA) (Tel. 209-781-6630).

3. Ames Company (Woodland, CA) (Tel. 916-666-2493).

2.12 FLOW-REGULATING VALVES

A. Valve: Automatic, pilot-operated, cast-iron body with interior coating according to AWWA C550. 250-psi working-pressure, bronze pressure-reducing pilot valve and tubing, and means for flow adjustment. Details as indicated.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:

1. Cla-Val Company (Newport Beach, CA) (Tel. 714-548-2201).

2. Bermad (Porterville, CA) (Tel. 209-781-6630).

3. Ames Company (Woodland, CA) (Tel. 916-666-2493).

2.13 SERVICE CONNECTIONS AND WATER METERS

A. Service connections and water meter details and boxes as indicated.

2.14 UNDERGROUND VAULTS/PITS

A. General: Portland cement concrete, precast or cast-in-place as indicated.

B. Portland Cement Concrete and Reinforcing Steel: Section 32 05 23 – Cement and Concrete for Exterior Improvements.

C. Access Openings: As indicated.

D. External Load: Earth load plus AASHTO H20 live load if located in paved areas.

E. Lids: Bolt down type.

2.15 TRACER WIRE

A. General: Minimum #12 AWG stranded copper wire with blue THW, THWN, or THHN rated insulation.

2.16 WARNING TAPE

A. General: Non-detectable 3-inch warning tape made of solid blue film with continuously printed black-letter message reading “CAUTION—WATER LINE BURIED BELOW.”

PART 3 EXECUTION

3.01 PIPE INSTALLATION

A. General: Install pipe, fittings, and appurtenances utilizing best practices, manufacturer’s instructions, and in accordance with the following:

1. DIP: AWWA M41 and AWWA C600.
2. PVC pipe: AWWA M23 and AWWA C605.
3. Steel Pipe: AWWA M11.

B. Pipe Depth and Trench Configuration: Conform to elevations, profiles and typical trench section(s) indicated.

C. Excavation, Bedding, Backfill, and Compaction: Section 31 23 33 – Trenching and Backfilling.

D. Handling: Carefully handle during loading, hauling, unloading and placing operations to avoid breakage or damage. Use strap type slings for lifting and placing; no chains or hooks will be permitted. Comply with manufacturer’s recommendations.

E. Laying: Before lowering pipe into the trench, remove all stakes, debris, loose rock and other hard materials from the bottom of the trench. Lay accurately in conformance with lines and grades indicated. Lay pipe on a bed of bedding material specified and prepared by handwork, dug true to grade. Furnish firm bearing for pipe throughout it’s entire length with bell holes provided at the ends of each pipe length of sufficient size to permit making up the particular type of joint being used. Adjust pipe to line and grade by scraping away or filling and tamping material under the body of the pipe for the entire pipe length and not by blocking or wedging. After final positioning, hold pipe in place in trench with backfill material placed equally on both sides of the pipe at as many locations as required to hold the pipe section in place.

F. Curved Alignment: When necessary to conform to the alignment specifically indicated, lay pipe on a curved alignment by means of asymmetrical closure of joints or bending of the pipe barrel. If necessary, use shorter than the standard lengths of pipe to achieve curvature specified. Do not exceed the recommendations of the pipe manufacture for deflections at the joints or pipe bending.

G. Closure: Close open ends of pipes and appurtenance openings at the end of each days work or when work is not in progress.

3.02 CONNECTING TO EXISTING MAINS

A. Pressure Tap Connections: Perform in accordance with the requirements of the owner of the system being tapped. Maintain a positive pressure flow from the main being tapped to the tapping device to flush plastic chips, metal ribbons, etc. into the tapping devise and

not into the pipe being tapped.

B. Other Connections: As indicated and in accordance with the requirements of the owner of the line being connected to.

3.03 ANCHORAGE INSTALLATION

A. Mechanically Restrained Joints: Install where indicated for lengths indicated in accordance with manufacturer's instructions.

B. PCC Thrust Blocks: Install where required and as indicated. Bearing area indicated is to be against undisturbed earth. Allow a minimum of 24-hours curing time before introducing water into the pipeline and allow a minimum of 7-days curing time before pressure testing.

3.04 HIGH DEFLECTION FITTINGS/BALL JOINTS, EXPANSION JOINTS, AND FLEXIBLE EXPANSION JOINTS

A. Install as indicated and in accordance with the manufacturers recommendations.

3.05 VALVE INSTALLATION

A. Install all valves in accordance with the manufacturer's instructions and the following:

1. General:

(a) Gate Valves: Appendix A of AWWA C509.

(b) Butterfly Valves: Appendix A of AWWA C504.

2. Joints:

(a) Valves on DI, PE and PVC Pipe: Mechanical joint valves for buried locations. Flanged-end valves for installation in vaults/pits.

(b) Valves on Steel Pipe: As indicated for buried locations. Flanged-end valves for installation in vaults/pits.

3.06 SERVICE CONNECTIONS INSTALLATION

A. Install as indicated and in accordance with the requirements of the owner of the system.

3.07 WATER METER INSTALLATION

A. Install as indicated and in accordance with the requirements of the owner of the system.

3.08 REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER INSTALLATION

A. Install as indicated and in accordance with the requirements of the owner of the system and the local health department requirements.

3.09 UNDERGROUND VAULT/PIT INSTALLATION

A. Install as indicated.

B. Excavation and Backfill: Section 31 23 33 – Trenching and Backfilling.

3.10 TRACER WIRE INSTALLATION

A. Install on trench bottom under the vertical projection of the pipe to protect it in all installations.

B. Form a mechanically and electrically continuous line throughout the pipeline, extending to the nearest valve or other pipeline appurtenance designated by the owner of the system or the Owner. Extend the wire up the outside of the valve box/riser and cut a hole that is 8-inches from the top, extend a 12-inch wire lead to the inside of the box. At other pipeline appurtenances, designated by the owner of the system or the Owner, terminate the 12-inch wire lead inside the enclosure.

C. Splice wire with a splicing device consisting of and electro-tin plated seamless copper sleeve conductor. Install as recommended by the manufacturer. Wrap splices and damaged insulation with electrician's tape.

3.11 WARNING TAPE INSTALLATION

A. Install tape approximately 1-foot above and along the centerline of the pipe.

B. Where tape is not continuous, lap tape ends a minimum of 2-feet.

3.12 HYDROSTATIC PRESSURE AND LEAKAGE TEST

A. General:

1. Provide all necessary materials and equipment, including water.

2. Backfill all trenches sufficient to hold pipe firmly in position.

3. Allow time for thrust blocks to cure prior to testing.

4. Flush all pipes prior to testing to remove all foreign material.

5. Perform pressure and leakage test concurrently.

6. Test pressure: See Subsection titled "System Performance Requirements."

7. Apply test pressure by means of a pump connected to the pipe.

8. Base test pressure on the elevation of the lowest point in the line.

9. Fill each closed valve section or bulk-headed section slowly. Expel air from section being tested by means of permanent air vents installed at high points or by means of temporary corporation cocks installed at such points. Remove and plug the temporary corporation cocks at the conclusion of the test.

10. Allow water to stand in the pipe for 24 hours before test pressure is applied.

11. Allow the system to stabilize at the test pressure before conducting the leakage test.

12. Do not operate valves in either the opening or closing direction at differential pressures above the valves rated pressure.

13. Maintain test pressure as specified for type of pipe being tested.

14. Pressure Test: Examine any exposed pipe, fittings, valves, hydrants and joints during the test, if no leaks are observed the section of line has passed the pressure test. If leaks are observed, repair any damaged or defective pipe, fittings, valves, or hydrants, and repeat the pressure test.

15. Leakage Test: Perform as specified hereafter for the type of pipe being installed.

B. DIP Leakage Test: Perform in accordance with AWWA C600. Selected requirements of AWWA C600 are repeated as follows:

1. Maintain the test pressure, +/- 5 psi, for a minimum of two hours.

2. No piping will be accepted if the leakage is greater than that determined by the following formula:

$L = (S \times D \times P^{1/2})/133{,}200$
L = Allowable leakage, gallons per hour.
S = Length of pipe tested, feet.
D = Nominal diameter of pipe, inches.
P = Average test pressure during the leakage test, pounds per square inch (gauge).

C. PE Pipe Leakage Test:

1. Apply the test pressure and allow the pipe to stand, without makeup pressure, for sufficient time to allow for diametric expansion or pipe stretching to stabilize, approximately two to three hours.

2. After the above stabilization has occurred, return the section being tested to the test pressure. Hold the test pressure for one to three hours. If the pressure in the test section drops, and it is determined the drop may be the result of expansion resulting from increasing temperature, a limited amount of additional water may be added to bring the pressure back to the test pressure. Allowable amounts of make-up water, to compensate for expansion due to increasing temperature, are as shown in the following table. Make-up water is only allowed during this final test period and not during the initial stabilization described in the previous paragraph. If the additional water added is less than the allowable shown in the table and there are no visual leaks or significant pressure drops, the tested section passes the test.

3. Nominal Allowance for Expansion

(U.S. Gals./100 Feet of Pipe)

Pipe Size	1-Hour Test	2-Hour Test	3-Hour

(in.) Test			
3	0.10	0.15	0.25
4	0.13	0.25	0.40
6	0.30	0.60	0.90
8	0.50	1.0	1.50
10	0.75	1.3	2.1
11	1.0	2.0	3.0
12	1.1	2.3	3.4
14	1.4	2.8	4.2
16	1.7	3.3	5.0
18	2.2	4.3	6.5
20	2.8	5.5	8.0
22	3.5	7.0	10.5
24	4.5	8.9	13.3
28	5.5	11.1	16.8
32	7.0	14.3	21.5
36	9.0	18.0	27.0
40	11.0	22.0	33.0
48	15.0	27.0	43.0

D. PVC Pipe Leakage Test: Perform in accordance with AWWA M23. Selected requirements of AWWA M23 are repeated as follows:

1. Maintain the test pressure, +/- 5 psi, for a minimum of two hours.

2. No piping will be accepted if the leakage is greater than that determined by the following formula:

$L = (N \times D \times P^{1/2})/7,400$
L = Allowable leakage, gallons per hour.
N = Number of joints in the length of the pipeline tested.
D = Nominal diameter of pipe, inches.
P = Average test pressure during the leakage test, pounds per square inch (gauge).

E. Cement Mortar Lined and Coated Steel Pipe Leakage Test: Perform in accordance with AWWA M11. Selected requirements of AWWA M11 are repeated as follows:

1. Maintain the test pressure, +/- 5 psi, for a minimum of two hours.

2. There shall be no significant leakage for pipe with welded joints or mechanical couplings.

3. For pipe joined with O-ring rubber gaskets, a leakage of 25 gallons per inch of diameter per mile per 24-hours is allowed.

3.13 DISINFECTION

A. All New Pipelines shall be disinfected in accordance with one of the three methods specified in AWWA C651 and the following:

1. Disinfect after pressure and leakage test have been performed and accepted.

2. The method used shall be at the Contractor's option, unless specified by the owner of the water system.

3. Engage the services of a commercial testing laboratory, approved by the owner of the water system, to perform the bacteriological tests specified in Section 5.1 of AWWA C651. Direct the testing laboratory to send the original report of the bacteriological testing to the owner of the water system. Should the laboratory report show that any sample taken was not acceptable, repeat the sterilization process shall until a satisfactory sterilization is accomplished.

4. Lawfully dispose of the chlorinated water.

END OF SECTION

SECTION 334000 – STORM DRAINAGE UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roadway and/or site storm drainage up to 5-feet of any on-site building.

1.02 RELATED DOCUMENTS

A. AASHTO:

1. M 252: Standard Specification for Corrugated Polyethylene Drainage Pipe.
2. M 294: Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter.

B. ASTM:

1. A 74: Standard Specification for Cast Iron Soil Pipe and Fittings.
2. A 615/A615M: Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
3. C 443: Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
4. C 564: Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
5. C 1173: Standard Specification for Flexible Transition Couplings for Underground Piping Systems.
6. D 1785: Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
7. D 2235: Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
8. D 2321: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.
9. D 2564: Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
10. D 2751: Acrylontrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
11. D 3034: Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

12. D 4101: Standard Specification for Polypropylene Injection and Extrusion Materials.
13. F 477: Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
14. F 656: Standard Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC)Plastic Pipe and Fittings.
15. F 679: Standard Specification for Poly(Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings.
16. F-1336: Standard Specification for Poly(Vinyl Chloride) (PVC) Gasket Sewer Fittings.

C. AWWA:

1. C104: Cement-Mortar Lining for Ductile Iron Pipe and Fittings.
2. C105: Polyethylene Encasement for Ductile-Iron Pipe Systems.
3. C110: Ductile-Iron and Gray-Iron Fittings.
4. C111: Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
5. C150: Thickness design of Ductile-Iron Pipe.
6. C151: Ductile-Iron Pipe, Centrifugally Cast.
7. C153: Ductile-Iron Compact Fittings.
8. M41: Ductile Iron Pipe and Fittings.

D. Caltrans Standard Specifications:

1. Section 65, Concrete Pipe.
2. Section 66, Corrugated Metal Pipe.
3. Section 70. Miscellaneous Drainage Facilities.
4. Section 72, Slope Protection.

E. Caltrans Standard Plans:

1. Plan D94A: Metal and Plastic Flared End Sections.
2. Plan D94B: Concrete Flared End Sections.
3. Plan D97A: Corrugated Metal Pipe Coupling Details No.1, Annular Coupling Band Bar and Strap and Angle Connections.
4. Plan D97B: Corrugated Metal Pipe Coupling Details No. 2, Hat Band Coupler and Flange Details.

5. Plan D97C: Corrugated Metal Pipe Coupling Details No. 3, Helical and Universal Couplers.
6. Plan D97D: Corrugated Metal Pipe Coupling Details No. 4, Hugger Coupling Bands.
7. Plan D97E: Corrugated Metal Pipe Coupling Details No. 5, Standard Joint.
8. Plan D97F: Corrugated Metal Pipe Coupling Details No. 6, Positive Joint.
9. Plan D97G: Corrugated Metal Pipe Coupling Details No. 7, Downdrain.
10. Plan D98A: Slotted Corrugated Steel Pipe Drain Details.
11. Plan D98B: Slotted Corrugated Steel Pipe Drain Details.

F. California Building Code:

1. Section 1806A.11 – Pipes and Trenches.
2. Section 1133B.7.2 – Gratings.

G. California Plumbing Code.

1.03 DEFINITIONS

A. AASHTO: American Association of State Highway and Transportation Officials.

B. ABS: Acylonitrile-butadiene-styrene.

C. ASTM: American Society for Testing Materials.

D. AWWA: American Water Works Association.

E. CMP: Corrugated metal pipe.

F. DIP: Ductile iron pipe.

G. HDPE: High-density polyethylene.

H. NPS: Nominal pipe size.

I. PE: Polyethylene.

J. PVC: Polyvinyl chloride.

K. RCP: Reinforced concrete pipe.

1.04 SUBMITTALS

A. Follow submittal procedures outlined in Division 01 Specifications.

B. Product Data Shop Drawings, Etc.: For the following:

1. Piping materials and fittings.

2. Special pipe couplings.
3. Polymer-concrete, channel drainage systems (trench drains).
4. Joint sealants.
5. Plastic area drains.
6. Precast concrete catch basins, inlets, curb inlets, and area drains, including frames and grates.
7. Concrete, metal and plastic flared end sections.

C. Design Mix Reports and Calculations: For each class of cast in place concrete.

D. Field Test Reports: Indicate and interpret test results for compliance with performance.

1.05 DELIVERY, STORAGE AND HANDLING

A. Do not store plastic structures, pipe and fittings in direct sunlight.

B. Protect pipe, fittings, and seals from dirt and damage.

C. Handle precast concrete pipe and other precast structures according to manufacturer's written instructions.

D. Protect imported bedding and backfill material from contamination by other materials.

PART 2 PRODUCTS

2.01 PIPING MATERIALS

A. Cast Iron Pipe and Fittings: Hub and spigot, 2-inch through 15-inch, ASTM A74, service class.

1. Gaskets: ASTM 564, rubber, compression type, thickness to match class of pipe.

B. Corrugated Metal Pipe: Caltrans Standard Specification Section 66.

1. Bituminous Coating: Caltrans Standard Specification Section 66-1.02C.
2. Bituminous Lining: Caltrans Standard Specification Section 66-1.02C.
3. Bituminous Pavings: Caltrans Standard Specification Section 66-1.02C.
4. Corrugated Aluminum Pipe: Caltrans Standard Specification Section 66-1.02F.
5. Corrugated Steel Pipe: Caltrans Standard Specification Section 66-1.02E.
6. Slotted Corrugated Steel Pipe: Caltrans Standard Specification Section 66-2.

7. Details: Caltrans Standard Plans D97A, D97B, D97C, D97D, D97E, D97F, D97G, D98A and D98B.

C. DIP: Sizes 4-inch through 48-inch.

1. Pipe: AWWA C150 and C151.

2. Pressure Class: Minimum pressure class for size indicated.

3. Fittings:

(a) Standard: AWWA C110, sizes 4-inch through 48-inch.

(b) Compact: AWWA C153, sizes 4-inch through 24-inch.

4. Pipe and Fitting Lining: Cement Mortar, AWWA C104.

5. Pipe and Fitting Coating: Asphaltic, AWWA C151 or C115.

6. Exterior Soil Corrosion Protection for Pipe and Fittings: Polyethylene encasement, AWWA C105.

7. Joints:

(a) Push-On Bell and Spigot Joint: AWWA C111.

(b) Mechanical Joint: AWWA C111.

(c) Flanged joint. AWWA C115.

D. Reinforced Concrete Pipe: Designated by Class, rubber gasketed joints.

1. Circular Reinforced Concrete Pipe: Caltrans Standard Specification Section 65-2.01D(3). Class III.

2. Oval shaped (Elliptical) Reinforced Concrete Pipe: Caltrans Standard Specification Section 65-2.01D(5)/2.02D. Class HE-III and VE-III.

3. Reinforced Concrete Pipe Arch: Caltrans Standard Specification Section 65-1.02C.

4. Rubber Gasketed Joints: Caltrans Standard Specification Section 65-2.02F.

E. HDPE Pipe and Fittings: 4-inch through 10-inch, AASHTO M 252 Type S, smooth interior and corrugated exterior. Bell and spigot joints.

1. Bell and Spigot Joint Gasket: Elastomeric seal, ASTM F 477.

2. Couplings: AASHTO M 252, corrugated band type. Engage a minimum of 4 corrugations, 2 on each side of pipe joint.

F. HDPE Pipe and Fittings: 12-inch through 48-inch, AASHTO M 294.Type S, smooth interior and corrugated exterior. Bell and spigot joints.

1. Bell and Spigot Joint Gasket: Elastomeric seal, ASTM F 477.

2. Couplings: AASHTO M 252, corrugated band type. Engage a minimum of 4 corrugations, 2 on each side of pipe joint.

G. PVC Pipe and Fittings-Smaller than 4-Inch: ASTM D1785, Schedule 40.

1. Joints: Solvent Cement, ASTM D 2564. Include primer according to ASTM F656.

H. PVC Pipe and Fittings,4-Inch and Larger

1. Pipe:

(a) 4-inch through 15-inch: ASTM D 3034, SDR 35. Bell and spigot joints.

(b) 18 inch through 36-inch: ASTM F 679, T-1 wall. Bell and spigot joints.

2. Fittings:

(a) 4-inch through 27-inch: ASTM F 1336.

(b) 30-inch through 36-inch: ASTM D 3034, SDR 35

3. Joint Gasket: Elastomeric seal, ASTM F 477.

2.02 PIPE ANCHORS

A. Section 32 05 23 – Cement and Concrete for Exterior Improvements.

2.03 SPECIAL PIPE COUPLINGS

A. Plastic, Cast Iron and Ductile Iron Pipe: ASTM C 1173, rubber or elastomeric sleeve and band assembly fabricated to match outside diameters of pipes to be joined.

B. Reinforced Concrete Pipe: Portland cement concrete collar as indicated.

C. Section 32 05 23 – Cement and Concrete for Exterior Improvements.

2.04 CURB INLETS, CATCH BASINS, DROP INLETS, AREA DRAINS, ETC.

A. General: Size, shape, configuration, depth, etc. of structure and frame, grate, or cover shall be as indicated.

B. Section 32 05 23 – Cement and Concrete for Exterior Improvements.

C. Precast Structure: Rate for AASHTO H20 loading in paved areas.

D. Steps: ASTM C 478 or AASHTO M 199. Manufacture from deformed, ½-inch steel reinforcement rod complying with ASTM A 615 and encased in polypropylene complying with ASTM D4101. Include pattern designed to prevent lateral slippage off step. Acceptable manufacturer is Hanson Concrete Products, (Milpitas, CA) (Tel 408-262-1091).

E. Frames, Grates and Covers: Caltrans Standard Specification Section 75-2, 75-3 and 75-1.02B.

1. Galvanize steel frames, grates and covers.

2. Grates and covers shall be non-rocking, bolt-down type.

3. Rate for AASHTO H20 loading in paved areas.

2.05 MANHOLES AND CLEANOUTS

A. See Section 33 05 16 – Utility Structures.

2.06 POLYMER-CONCRETE TRENCH DRAINS

A. General: Modular system of precast, polymer-concrete channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling. Include number of units required to form total length required.

B. Include the following components:

1. Channel Sections: Interlocking-joint, precast modular units with end caps. Inside width as indicated with deep, rounded bottom, with built in slope or flat invert as indicated and outlets in number, sizes, and locations indicated. Include extension sections necessary for required depth.

2. Frame and Grate: Gray iron, ductile iron or galvanized steel as indicated. Where drain is located in traffic areas, rate for AASHTO H20 loading.

C. Locking Mechanism: Manufacturer's standard device for securing grates to channel sections.

D. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Project include, but are not limited to, the following:

1. "Polydrain" by ABT Inc. (Troutman, NC) (Tel 704-528-9806) or approved equal.

2. "ACO Drain" by ACO Polymer Products Inc. (Chardon, OH) (Tel. 800-543-4764) or approved equal.

2.07 METAL, CONCRETE OR PLASTIC FLARED END SECTIONS

A. General: Caltrans Standard Specification Section 70-5.02 and Caltrans Standard Plan D94A and D94B.

2.08 CONCRETE/SHOTCRETE DITCH LINING

A. General: Caltrans Standard Specification Section 72-5.02.

1. Bar Reinforcement: Caltrans Standard Specification Section 52-1.02B, minimum Grade 40.

2. Welded Wire Fabric: Caltrans Standard Specification Section 52-1.02C. Use 6 x 6-W1.4 xW1.4 unless otherwise indicated.

PART 3 EXECUTION

3.01 PIPE INSTALLATION

A. General: Install pipe, fittings, and appurtenances utilizing best practices, manufacturer's instructions, and in accordance with Section 6 and 7 of ASTM D 2321 for plastic pipe, Caltrans Standard Specification Section 65-2.03C for reinforced concrete pipe, Caltrans Standard Specification Sections 66-1.045 and 66-105 for corrugated metal pipe and chapter 11.3.3 of AWWA M41 for cast iron and ductile iron pipe.

B. Pipe Depth and Trench Configuration: Conform to typical trench section(s) indicated.

C. Excavation, Bedding, Backfill, and Compaction: Section 31 23 33 – Trenching and Backfilling.

D. Handling: Carefully handle during loading, hauling, unloading and placing operations to avoid breakage or damage. Use strap type slings for lifting and placing; no chains or hooks will be permitted. Comply with manufacturer's recommendations.

E. Laying: Before lowering pipe into the trench, remove all stakes, debris, loose rock and other hard materials from the bottom of the trench. Lay accurately in conformance with lines and grades indicated. Start laying the pipeline at the low end and proceed upstream. Lay bell and spigot pipe with the bell end facing upstream. Lay pipe on a bed prepared by handwork, dug true to grade. Furnish firm bearing for pipe throughout it's entire length with bell holes provided at the ends of each pipe length of sufficient size to permit making up the particular type of joint being used. Adjust pipe to line and grade by scraping away or filling and tamping material under the body of the pipe for the entire pipe length and not by blocking or wedging. After final positioning, hold pipe in place in trench with backfill material placed equally on both sides of the pipe at as many locations as required to hold the pipe section in place.

F. Curved Alignment: When necessary to conform to the alignment specifically indicated, lay pipe on a curved alignment by means of asymmetrical closure of joints or bending of the pipe barrel. Use shorter lengths of pipe than the standard length if necessary to achieve curvature specified. Do not exceed the recommendations of the pipe manufacture for deflections at the joints or pipe bending.

G. Closure: Close open ends of pipes and appurtenance openings at the end of each days work or when work is not in progress.

3.02 SPECIAL PIPE COUPLINGS

A. General: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.

B. Installation: Per manufacturer's instructions.

3.03 INSTALLATION OF CURB INLETS, CATCH BASINS, DROP INLETS, AREA DRAINS, ETC.

A. Excavation, Bedding, Backfill, and Compaction: Section 31 23 33 – Trenching and Backfilling.

B. Poured in Place Structures: Install as indicated and Caltrans Standard Specification Section 51.

1. Shape bottoms to convey flows as indicated.

C. Precast Structures: Install as indicated.

1. Seal all joints and pipe entrances and exits.

2. Place concrete in bottom and shape to convey flows as indicated.

3.04 POLYMER-CONCRETE TRENCH DRAIN INSTALLATION

A. Excavation, Bedding, Backfill, and Compaction: Section 31 23 33 – Trenching and Backfilling.

B. Install: As indicated and in accordance with the manufacturer’s instructions.

3.05 CONCRETE OR PLASTIC FLARED END SECTION INSTALLATION

A. Install: As indicated.

END OF SECTION

APPENDIX ‘A’

HORTICULTURAL SOILS REPORT

Report 25-154-0022

June 9, 2025

Tanaka Design Group
3755 Balboa Street, Suite 204
San Francisco, CA 94121

RE: Tenaya MS, Merced

Background

One sample was submitted by the client identified as site soil from areas where new landscaping is scheduled for installation including an athletic field. The sample was analyzed for horticultural suitability, fertility and physical characteristics for WELO compliance by Waypoint Analytical, Inc. Fertilizer and amendment recommendations were requested. A planting plan was provided. The results of the analyses are attached.

Analytical Results and Comments

The reaction of the sample is slightly alkaline at a pH of 7.2 with qualitative lime favorably low. This is within the preferred range for most plants, including those on the provided planting plan. Salinity (ECe), sodium and boron are safely low. The sodium adsorption ratio (SAR) indicates that sodium is adequately balanced by soluble calcium and magnesium: this balance is important for soil structure quality, which relates to the rate at which water infiltrates the soil.

According to the USDA Soil Classification system, the texture of the less than 2mm fraction of the soil is classified as sandy clay loam. Organic matter content is favorable at 4.9% dry weight. Based on this information the estimated infiltration rate ranges from a moderate 0.27 inch per hour. Infiltration rates may vary due to differences in compaction across the site.

The favorable level of organic matter present may be partly due to the presence of existing undecomposed organic material such as turf roots. If this is the case, an optional rate for organic amendment incorporation is included below as undecomposed organic material will not provide the same ecosystem function as a fully composted greenwaste material. In areas where the soil grade is being changed more significantly this rate may need to be adjusted as the shallower soil with more organic material present is removed.

In terms of soil fertility, nitrogen, phosphorus and sulfate are low and calcium is fair. All of the other major nutrients are sufficient to abundant for proper plant nutrition at this time. Of the micronutrients; copper is sufficient while zinc, manganese and iron are low.

Recommendations

Incorporation of nitrogen, phosphorus, calcium and sulfate fertilizers is recommended at the time of planting. Incorporation of a composted greenwaste organic amendment is also recommended in order to help improve soil nutrient holding capacity and porosity. This should potentially also provide supplemental phosphorus, potassium and micronutrients, product depending.

Report 25-154-0022

The primary symptom of zinc, manganese and iron deficiencies is a general yellowing of leaves with veins remaining green. In severe cases, leaves may become pale yellow or whitish, but veins remain green. Brown spots may develop between veins and leaf margins may turn brown. Zinc deficiencies typically appear first on older, interior leaves. Manganese deficiency symptoms appear first on younger leaves. Iron deficiency shows first and more severely on the newer growth at branch tips. If these symptoms are present after plant installation they may be treated with an application of a chelated micronutrient product at the manufacturer's recommended rate. Incorporation of a composted greenwaste amendment would also provide additional micronutrients and may be sufficient to negate any deficiency, product depending.

To Prepare for Mass Planting:

Drainage of the root zone should be improved by first loosening the top 10 inches of any undisturbed or compacted soil. The following materials should then be evenly spread and thoroughly blended with the top 6 inches of soil to form a homogenous layer:

Amount per 1000 Square Feet **Conventional**

4 cubic yards	Composted Greenwaste Organic Amendment* (optional)
7 pounds	Ammonium Sulfate (21-0-0)
2 pounds	Triple Superphosphate (0-45-0)*
40 pounds	Gypsum (Calcium Sulfate)

OR

Amount per 1000 Square Feet **Organic**

4 cubic yards	Composted Greenwaste Organic Amendment* (optional)
6 pounds	Blood Meal (12-0-0)
14 pounds	Feather Meal (12-0-0)
4 pounds	Steamed Bone Meal (3-15-0)*
40 pounds	Gypsum (Calcium Sulfate)

*The rate may change based on the analysis of the chosen organic amendment. This rate is based on 270 lbs. of dry weight of organic matter per cubic yard of amendment. If a composted greenwaste amendment is chosen that provides a substantial amount of phosphorus, the steamed bone meal or triple superphosphate should be reduced or omitted accordingly.

For areas where turfgrass is being installed, the organic amendment should be decreased by half.

To Prepare Backfill for Trees and Shrubs:

- Excavate planting pits at least twice as wide as the diameter of the rootball.
- Soil immediately below the root ball should be left undisturbed to provide support but the sides and the bottom around the side should be cultivated to improve porosity.
- The top of the rootball should be at or slightly above final grade.
- The top 12 inches of backfill around the sides of the rootball of trees and shrubs may consist of the above amended soil or may be prepared as follows:

4 parts	Site Soil
1 part	Composted Greenwaste Organic Amendment*

Uniformly blended with:

Amount per Cubic Yard of Backfill **Conventional**

1/3 pound	Ammonium Sulfate (21-0-0)
1/8 pound	Triple Superphosphate (0-45-0)*
2 pounds	Gypsum (Calcium Sulfate)

OR

Amount per Cubic Yard of Backfill **Organic**

1/3 pound	Blood Meal (12-0-0)
3/4 pound	Feather Meal (12-0-0)
1/4 pound	Steamed Bone Meal (3-15-0)*
2 pounds	Gypsum (Calcium Sulfate)

- Backfill below 12 inches required for 24 inch box or larger materials should not contain the organic amendment, blood meal, feather meal or ammonium sulfate but should still contain the triple superphosphate or steamed bone meal and gypsum at the recommended rate.
- Ideally a weed and turf free zone should be maintained just beyond the diameter of the planting hole. A 2-4 inch deep layer of coarse mulch can be placed around the tree or shrub. Mulch should be kept a minimum 4 inches from the trunk.
- Irrigation of new plantings should take into consideration the differing texture of the rootball substrate and surrounding soil matrix to maintain adequate moisture during this critical period of establishment.

Maintenance

For turf areas, new sod should receive a light fertilization 2 weeks after planting with 8-3-5 applied at a rate of 8 pounds per 1000 square feet. For turf from seed this application should be after the first mowing. The area may then be maintained with primarily a nitrogen program of applying 8 pounds of Blood Meal (12-0-0) per 1000 square feet. Treatment should be at 45 to 60 day intervals until the turf becomes well established. Once the turf is well established, the frequency of fertilization should be decreased depending on color and rate of growth desired. In the spring and fall substitute a complete fertilizer such as 5-5-5 to help ensure continuing adequate phosphorus and potassium.

Maintenance fertilization for other areas should rely primarily on a nitrogen only program supplemented with a complete fertilizer in the fall and spring. Beginning 45-60 days after planting, ammonium sulfate (21-0-0) should be applied at a rate of 5 pounds per 1000 square feet with reapplication every 45-60 days. Alternatively, slow release Sulfur-coated Urea (43-0-0) may be applied at 6 pounds per 1000 square feet every 90 days. Once plants are performing satisfactorily, the frequency of fertilization may be decreased depending on color and rate of growth desired. In the winter for a quick greening effect, calcium nitrate (15.5-0-0) may be applied at a 6 pound rate if applicable. Early fall and spring, substitute a complete fertilizer such as 15-15-15 to help ensure continuing adequate phosphorus and potassium.

If organic maintenance recommendations are preferred, Blood Meal (12-0-0) provides available nitrogen fairly rapidly while materials such as Feather Meal (12-0-0), Soybean or Cotton Seed Meal (7-1-1) are slower to provide available nitrogen, but they extend the length of time they make this contribution. In order to provide a good supply of nitrogen for a 3-4 month time frame a good combination would be 6 pounds Blood Meal and 14 pounds Feather Meal per 1000 square feet. In the fall and spring, substitute a complete organic fertilizer such as 5-5-5 applied at the manufacturer's label rate. Or, nutrient rich composted greenwaste may be spread n a 1 to 2 inch layer, which generally carries enough nutrition to boost complete nutrition though a source of nitrogen might also be added at a half rate to ensure adequate nitrogen availability.

If we can be of any further assistance, please feel free to contact us.



Annmarie Lucchesi
annmarie@lucchesiconsulting.com

Emailed 5 Pages: bob@tanakadesign.com

Lucchesi Plant & Soil Consulting, LLC
P.O. Box 320401

Los Gatos CA 95032-0401

Waypoint ANALYTICAL

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 º Fax 714-282-8575
www.waypointanalytical.com

Project : Tenaya Middle School Sports Field - Merc

COMPREHENSIVE SOIL ANALYSIS

Report No : **25-154-0022**
Purchase Order : 25-154-0022
Date Recd : 06/03/2025
Date Printed : 06/06/2025

Sample Description - Sample ID	Half Sat %	pH	ECe dS/m	NO_3-N ppm	NH_4-N ppm	PO_4-P ppm	K ppm	Ca ppm	Mg ppm	Cu ppm	Zn ppm	Mn ppm	Fe ppm	Organic % dry wt.	Lab No.
	TEC	Qual Lime		Sufficiency Factors											
Site Soil	26	7.2	0.55	15	4	0	257	1680	700	1.2	2.4	4	23	4.90	17082
	150	Low		0.4		0	1.3	0.7	2.1	0.6	0.3	0.2	0.3		

Saturation Extract Values						SAR	Gravel %		Percent of Sample Passing 2 mm Screen					USDA Soil Classification	Lab No.
									Sand						
Ca meq/L	Mg meq/L	Na meq/L	K meq/L	B ppm	SO_4 meq/L		Coarse 5 - 12	Fine 2 - 5	Very Coarse 1 - 2	Coarse 0.5 - 1	Med. to Very Fine 0.05 - 0.5	Silt .002-.05	Clay 0-.002		
2.3	1.69	2.76	0.56	0.31	1.1	2.0	3.0	5.8	3.2	6.8	39.8	23.6	26.5	Sandy Clay Loam	17082

Sufficiency factor (1.0=sufficient for average crop) below each nutrient value. N factor based on 200 ppm constant feed. SAR = Sodium adsorption ratio. Half Saturation %=approx field moisture capacity. Nitrogen(N), Potassium(K), Calcium(Ca) and Magnesium(Mg) by sodium chloride extraction. Phosphorus(P) by sodium bicarbonate extraction. Copper(Cu), Zinc(Zn), Manganese(Mn) & Iron(Fe) by DTPA extraction. Sat. ext. method for salinity (ECe as dS/m),Boron (B), Sulfate(SO_4), Sodium(Na). Gravel fraction expressed as percent by weight of oven-dried sample passing a 12mm(1/2 inch) sieve. Particle sizes in millimeters. Organic percentage determined by Walkley-Black or Loss on Ignition.

* LOW , SUFFICIENT , HIGH